| Access | DB# | | | |
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SEARCH REQUEST FORM

Scientific and Technical Information Center

| Requester's Full Name: | | Examiner # : | Date: |
|---|---|---|-------------------------------|
| Art Unit: Phone Ni | umber 30 | Serial Number: | |
| Mail Box and Bldg/Room Location: | Resu | lts Format Preferred (circle): | PAPER DISK E-MAIL |
| If more than one search is submit | tted, please prioritize | e searches in order of ne | ed. |
| Please provide a detailed statement of the si include the elected species or structures, ke utility of the invention. Define any terms the known. Please attach a copy of the cover sh | earch topic, and describe a ywords, synonyms, acrony hat may have a special mea | s specifically as possible the sub ons, and registry numbers, and c aning. Give examples or relevan | ject matter to be searched. |
| Title of Invention: | | | |
| Inventors (please provide full names): | | | |
| Earliest Priority Filing Date: | | | |
| *For Sequence Searches Only* Please include appropriate serial number. | e all pertinent information (p | parent, child. divisional, or issued p | atent numbers) along with the |
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| 0-24 042 042 042 004 004 004 004 004 004 0 | | **** | ***** |
| STAFF USE ONLY Searcher: P. Schre. Zer | Type of Search NA Sequence (#) | Vendors and cost w | • • |
| Searcher: 308 - 4272 | AA Sequence (#) | STN | |
| Searcher Location: CM 1 12 E18 | Structure (#) | Questel Orbit | |
| Date Searcher Picked Up: 9/2 4 | Bibliographic | Dr.Link | |
| Date Completed. 9/2 4 | Littgation | Lexis/Nexts | |
| Searcher Prep & Review Time | Fulltext | Sequence Systems GCG F | FastPB Ig Fast PB |
| Clencal Prep Time | Patent Family | WWW/Internet | |

Other (specify)_

PTO-1590 (1-2000)

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STIC-Biotech/ChemLib

51410

From:

Sent:

Portner, Ginny Friday, September 21, 2001 11:16 AM STIC-Biotech/ChemLib

To:

Subject:

FW: 09/252,691

actually, I don't need the sequence searched against the entire data base but only need SEQ ID NO 1394 searched against the following sequences. Thanks

ID PSI RSU; PATTERN. AC PS01149; DT NOV-1995 (CREATED); JUL-1999 (DATA UPDATE); JUL-1999 (INFO UPDATE). DE Rsu family of pseudouridine synthase signature. PA G-R-L-D-x(2)-[STA]-x-G-[LIVFA]-[LIVMF](3)-[ST]-[DNST]. NR /RELEASE=38,80000; NR /TOTAL=18(18); /POSITIVE=18(18); /UNKNOWN=0(0); /FALSE_POS=0(0); NR /FALSE NEG=0; /PARTIAL=0; CC /TAXO-RANGE=???P?; /MAX-REPEAT=1;-DR P35159, RLUB_BACSU, T; P33918, RSUA_ECOLI, T; P45124, RSUA_HAEIN, T; DR O51155, Y129_BORBU, T; Q55578, Y361_SYNY3, T; O66829, Y554_AQUAE, T; DR P72581, Y612_SYNY3, T; P42395, YCIL_BUCAP, T; P37765, YCIL_ECOLI, T; DR P45104, YCIL_HAEIN, T; P55986, YE59_HELPY, T; O67444, YE64_AQUAE, T; DR P32684, YJBC_ECOLI, T; P75966, YMFC_ECOLI, T; P44827, YMFC_HAEIN, T; DR O05668, YRSU_MYCLE, T; O33210, YRSU_MYCTU, T; O32068, YTZF_BACSU, T; DR D0000885; DO PDOC00885;

Thanks

Original Message-----

Fr m:

Portner, Ginny

Sent:

Friday, September 21, 2001 11:05 AM

STIC-Biotech/ChemLib

Subject:

09/252,691

Please search SEQ ID No 1394.

Ginny Rortner CM1, Art Unit 1645 Room 7e13 Mail box 7e12 (703) 308-7543

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PARAMETERS

SEARCH STATISTICS

| Scores: | Mean 50 | Median 36 | Standard Deviation 23.25 |
|--|-----------------|--------------|------------------------------|
| Times: | CPU 00:00:00 | | Total Elapsed 00:00:01.00 |
| Number of residues: Number of sequences searched: | : searched: | 344036 | |

Number of residues: 344036
Number of sequences searched: 7
Number of scores above cutoff: 7

A 100% identical sequence to the query sequence was not found.

The scores below are sorted by initial score. Significance is calculated based on initial score.

The list of best scores is:

| Init. Opt. Description Length Score Stor Frame | **** 1 standard deviation above mean **** TOIG of: 109228 check: 8816 28206 88 318 1.63 TOIG of: u00008 check: 8999 39149 77 291 1.16 **** 0 standard deviation from mean **** | TOIG of: 299116 check: 4068 18470 52 288 0.09 0 TOIG of: ae0000213 check: 187 10959 35 288 0.65 0 TOIG of: ae000308 check: 691 11961 35 302 -0.65 0 TOIG of: d90748 check: 3982 15007 34 292 -0.69 0 TOIG of: d90749 check: 928 20284 31 289 -0.82 0 | 591C-1394 (1-669) TOIG of: 109228 check: 8816 from: 1 to: 28206 9228 check: 8816 from: 1 to: 28206 | Bacillus subtilis spoVA to serA region. L09228. L03228.1 GI:410114 Gerarboxylase; lysA gene; aroC gene; diaminopimelate dehydroquinate dehydratase; aroC gene; diaminopimelate decarboxylase; lysA gene; penicillin-binding protein; peptidyl-prolyl isomerase; phosphoglycerate dehydrogenase; ppiB gene; response requlator; response requlator; response requlator; ribb gene; ribA gene; ribb gene; r | gene; spoVAF gene. Bacillus subtilis (strain 168, sub_species Marburg) DNA. Bacillus subtilis Bacitlus subtilis Bacillus/Clostridium group; Bacillus/Staphylococcus group; Bacillus. 1 (bases I to 28206) 4 (bases I to 28206) Molecular cloning and analysis of nucleotide sequence of the Bacillus subtilis lysA gene region using B. subtilis phage vectors | ol. Chem. 55 1 to 28206) C.E. and Ling and sequence | J. Bacteriol. 174 (6), 1717-1725 (1992) 92193254 3 (bases 1 to 28206) Scrokin, A., Zumstein, E., Azevedo, V., Ehrlich, S.D. and Serror, P. The organization of the Bacillus subtilis 168 chromosome region between the spoVA and serA genetic loci, based on sequence data Mol. Microbiol. 10 (2), 385-395 (1993) | Location/Qualifiers 1. 28206 /organism=Bacillus subtilis" /strain="168" /sub_species="Marburg" /db_xref="taxon:1423" | J. 1239 /gene="spoVAF" 21239 /codon_start="1 /transl_table=11 /translation="vDIVENELLNAQVEKVKTLDETTDQVLSGLVAVIVEGAGFAFII /cosyPGRANPEEDOTEKVVRARADGFYENIVVNTALLRRRRIEDERLEVKWTKTGERSK DVASYPGRAPEEDOTEKVVRARADGFYENIVVNTALLRRRRIEDERLEVKWTKTGERSK TDLSICY IEDIADPDLVBTVEKELASIDVDGLTMADKTVEEFIVNGSYNPPPLVRYTE RPDVAANHVLEGHVIIIVDTSPSVIITPTTLFHHVQHAEEYRQAPSVGTFLRWVRFFG ILASTLFLPTWFLFVLQPDLLDDNMKFIGLNKDTHIPIILQIFLADLGIEFLRWAAIH |
|---|--|--|--|--|--|--|---|--|---|
| Sequence Name | 1. 109228 2. u00008 | 3. z99116 4. ae000213 5. ae000308 6. d90748 7. d90749 | 1. US-09-252-691C 109228 TOIG of: 109228 | LOCUS DEFINITION BACACESSION VERSTON KEYWORDS Deg Per | SOURCE Bac ORGANISM Bac Bac Bac Bac Bac TTTLE MOJ | JOURNAL ADIL MEDLINE 91: REFERENCE 2 AUTHORS BUG TITLE ISC | | FEATURES | gene |

CDS

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gene

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                       terminator
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9362. .10009
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18150. 18170
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/note="homology with E. coli Fur-box; putative"
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/note="for dacB; putative"
17396. .17402
/note="putative; ORFX13"
/note="putative; ORFX13"
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/note="ORFX13"
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18261. 18806
/note="ORFX14"
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/note="ORFX11"
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270

CDS

terminator

-35_signal

gene

-10_signal

CDS

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160 170 180 200 210
ATG---TATTGCCGCAGTTTACCGACGAGGCCGGGCGCAGCAGCAGGACGTGAAGGACCGTTATATCCCCGTA-----C
                                                                                                                                                                                                                            AGCGCATTTATCCGATTGGGCGTCTGGACTATGATA-CGAGCGGTCTTTTGCTTTTAACCAATGACGGCGAA
7720 17730 17740 17750 17760
                                                                                                                                                                                                                                                                                                                                                                                                                                          560 570 580 520 620 recordedactentrectac-eccategegeaget-tacgegeageactege
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CGGACGACGCGTCGCTGGCAAAGCTGCGCAACGGCGTAACGCTGAACGACGGTCCCACCCTGCTGGTA
ACGCCTGAAAA-TA-CCATGA--CGAAAACTTCTTTTAGAAAACACCGGGTTGAG-----CGATTCAGCTCA
                                                                                                                                                                                                                                                                                                                 AGGGAGTCTACGCAGCGGGACGTCTGGATCGCGACAGCGAG-GGGCTGCTGGTCCTTACCAATGACGGCG---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ECOHU49 39149 bp DNA BCT centisome 49 region of E.coli K12 BHB2600. U000008 U00008.1 GI:453985
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u000008 TOIG of: u000008 check: 8999 from:
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18200 18210 18230
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DEFINITION
ACCESSION
VERSION
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                                                                                                 VRICEACAAIAVITAFIISPHFDDAQDQQKEASQBNAVETERSDSPKAASSLDQ
TSEVVPEKBODNITYAVADADTSAIIPVSIQKTANDOTIODMLFESSELGILDHAIT
TPFTLDEVEIKEKPOKELSIRVHQPATASIKDDTLLKKLLKESLKWSPYEKVFLS
DQNETGVRIGSYGFFEISIRVGSKRSYLYONKOGOPELVPENHSPOTVKELAIKENE
SSORDTTPLIQAGAVOSVTKKOKHLYMRESKESEVDDSIAGILMIEGLLITAKEFGF
TEVTFTETRYKKIGKYDISDAIPVPAAPNPISLN"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /translation-"ISSLMRHIPQANISVKSREWNRTAYVGSELYGKTLGIVGLGRIG
SEIAQRRGAFGMTVHVFDPFLTEERAKKIGVNSRTFEEVLESADIITVHTPLIKETKG
LLNKETIAKTKKGVRLINCARGGIIDEAALLEALENGHVAGAALDVFEVEPPVDNKLV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            YHQIAGKIGSLVSQCMKEPVQDVAIQYEGTIAKLETSFITKALLSGFLKPRVDSTVNE
VNAGGVAKERGISFSEKISSSESGYDNCISVKVTGDRSTFTVTATYIPHFGERIVEIN
GFNIDFYPTGHLVYIQHQDTTGVIGRVGRILGDNDINIATMQVGRKEKGGEAIMMLSF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SAIQTKDIDLIDIELFSGDANVKALVSLAEENNVYVVMSNHDFEKTPVKDEIISRLRK
MQDLGAHIPKMAVMPNDTGDLLTLLDATYTMKTIYADRPIITMSMAATGLISRLSGEV
FGSACTFGAGEEASAPGQIPVSELRSVLDILHKNTRG"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VEWRYDVFEKANDREAVTKLISKLRKSLEDKLFLFTFRTHKEGGSMEMDESSYLALLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DHPLVIATPHLGASTKEAQLNVAAQVSEEVLQFAKGLPVMSAINLPAMTKDEFAKIKP
                                                                                    /translation-"MMKSEWNEEQIKELLSQLPAVKDHRSPQDIYKRLTMAKRKNKPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                X 10 co
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17440 17450 17460 17470 17480 17450 17500
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255
0
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Matches = 380 Mismatches
Conservative Substitutions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /product="phosphoglycerate dehydrogenase"
/protein_id="AAA67502.1"
/db_xref="GI:410116"
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/note="for OFKX20-ORFX21; putative"

26073. .26073

/gene="aroc"

/gene="putative"

26096. .26101

/gene="putative"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DRHLEDKIVKELTNVPDIVSVKLIDLP"
5565 c 6530 g 7582 t
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /note="for arcc"
complement(26946. .28206)
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                                                   /protein_id="AAA67500.1"
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26136, .26903
/gene="aroC"
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26130. .26139
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /codon_start=2
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                                                                                                                                                                                                                                                                                                                                                                                       26130. .26139
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          26909. .26944
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /gene="serA"
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528
94
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                                                                                                                                                                                                                                                                                                                                                                                       protein_bind
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terminator

gene

CDS

480

410

10-FEB-1994

to: 39149

Initial Score Residue Identity Gaps

BASE COUNT

9

REFERENCE AUTHORS

KEYWORDS

AUTHORS REFERENCE

```
/gene="probable transport operon; yejA-yejB/C-yejE-yejF.
Homologous to ABC-type transporters; closest similarity to
oliopeptide transporters. Close proximity of inferred
start and stop codons suggests translational coupling
between all 4 genes."
//note="Probable membrane-bound component of transport
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              KPLLVRYDGSWYFPLLKNYSESDFGGPLASQADYQDPWLKQRLENNGWVLWAPIRFGA
TSINFATNKPFPSPPSRQNWLGTDANGGDVLARILYGTRISVLFGLMLTLCSSVWGVL
AGALQGYYGGKVDLWGQRFIEVWSGMPTLFLIILLSSVVQPNFWMLLAITVLFGWMSL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             VGYVRAEFLIRTRNFDY IRAAQALGVSDRSIILRHMLPNAMVATLTFLPFILCSSITTL
SLDFILGFGLPLGSPSLGELLLQGRNNLQAPWLGITAFLSVAILLSLLIFIGBAVRDA
FDDNKAV"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /translation-"MTQTLLAIENLSVGFRHQQTVRTVVNDVSLQIEAGETLALVGES
GSGKSYTALSTIRLLESPPEYELSGETREGESLHASDQTIKGVRGRIN TAMFOEPM
GSGKSYTALETIRGLESPPEYELSGETREGESELHASDQTIKGLEGENTAMFIRATIFOEPM
GSGKSYTALTERGLYFTSLHRGMRFARFILNCLDRYGTRGARKLTDYPHQLSGE
ERQRYMIAMALLTRPELLIADEPTTALDVSVQAQILQLLRELQGELNMGMLFITHNLS
TVRKLAHRAVMQNGRVQBYAATLENSPFHTRYQKLLNESPSGDPYPLPEPASTLL
DVBCALQVAFPIRGILKRIVDHNVVVKNISFTLRAGETLGIVGESGSGKSTTGLALLR
LINSQGSIIFDGQPLQNLNRRQLLPIRHRIQVVFQDPNSSLNPRLNVLQIIEEGLRVH
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GNAGVLPGAGGEGVRASHAQTGVGNISDSNYRGGRGLDPEVIAEITHRYGFDKPIHER
YFKMLWDYIRFDFGDSLFRSASVPDAD"
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EPTSSLDKTVQAQILTLLKSLQQKHQLAYLFISHDLHVVRALCHQVIILRQGEVVEQG
PCARVFATPQQEYTRQLLALS"
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IYGPMADSGRRPVVLGGTLVFAAAAVACALANTIDQLVWRFHGIAAAAASVVINA
ILMDIYPKEEFSRWAGVLYTTIAPLMAPYPGGWVLVWLSWYIFWILALAAILASA
MIFFLIKETLPPERRQPFHIRTIGNPALFRKVLSYMLAGFSFAGMFSFLSAGP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /translation="MSRLSPVNQARWARFRHNRRGYWSLWIFLVLFGLSLCSELIAND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /translation="mtSLQLSIVHRLPQNYRWSAGFAGSKVEPIPQNGPCGDNSLVAL
KLLSPDGDNAWSVMYKLSQALSDIEVPCSVLECEGEPCLFVNRQDEFAATCRLKNFGV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        FVY IEINHVAPENFGYYFALNIVFLEVMTIFNSRFVRRIGALNMFRSGLMIQFIMAAM
MVISALLGLGFWSLVVGVAAFVGCVSMVSSNAMAVILDEFPHMAGTASSLAGTFRFGI
GAIVGALLSLATFNSAWPMIWSIAFCATSSILFCLYASRPKKR"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            3353. .4942
/gene="probable transport operon; yejA-yejB/C-yejE-yejF.
/fgene="probable transporters; closest stainlarity
oliopeptide transporters. Close proximity of inferred
start and stop codons suggests translational coupling
                                                                                                                                 /gene="yejC -- probably a frameshift fragment of yejB"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /note="bicyclomycin resistance gene"
                                                                                                                                                                                                                                                                                                                                                                                                                            /codon_start=1
/transl_table=11
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/db_xref="GI:405910"
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/db_xref="G1:424052"
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/note="GTG start codon"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       complement(6841. .7536)
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Homologous to ABC-type transporters; closest similarity to
oliopeptide transporters. Close proximity of inferred
start and stop codons suggests translational coupling
between all 4 genes."
//note="weak match to heme-binding protein from
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Homologous to ABC-type transporters; closest similarity to
ollopeptide transporters. Close proximity of inferred
start and stop codons suggests translational coupling
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NRGRWNFDTIRYDYYLDDNVAFEAFRAGAFDLRMENDAKWWATRYTGKNFDKKYIIKD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GGVLKGQQRVNATTGQPLSFELLLPASSNSOWYLPFOHSLORLG INMDTRKVDNSQIT
NRMRSRDYDMMPRVWRAMPWPSSDLQISWSSEY INSTYNAPGVOSPVIDSLINQIIAA
QGNKEKLLPLGRALDRVLTWNYYMLPMMYMAEDRLAWWDKFSQPAVRPIYSLGIDTWW
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Submitted (10-FEB-1994) Department of Genetics, Harvard Medical School, 200 Longwood Avenue, Boston Ma 02115 on Feb 10, 1994 this sequence version replaced gi:405903.

From E.coli Kl2 BHB2600. All of the sequence in this contig was sequenced at least twice on one strand and once on the other strand, except in the 2 regions marked. The annotation of this sequence should be considered preliminary and incomplete. Please contact KRobison@nucleus.harvard.edu before citing this sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /note="probable integral membrane component of transport complex (oligopeptides?); C-terminus may be truncated to form yejC"
                                                                                                                                    1 (bases 1 to 39149)
Richterich, P., Lakey, N., Gryan, G., Jaehn, L., Mintz, L., Robison, K.
and Church, G.M.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /gene-"probable transport operon; yejA-yejB/C-yejE-yejF.
Homologous to ABC-type transporters; closest similarity
oliopeptide transporters. Close proximity of inferred
start and stop codons suggests translational coupling
between all 4 genes."
                                                                                           Bacteria; Proteobacteria; gamma subdivision; Enterobacteriaceae;
                                                                                                                                                                                                                                                                                                                                                                                      Direct Submission
Submitted (29-SEP-1993) Department of Genetics, Harvard Medical
School, 200 Longwood Avenue, Boston MA 02115
3 (bases 1 to 39149)
Robison, K.
                                                                                                                                                                                                                                                               Automated multiplex sequencing of the E.coli genome

    .39149
    /organism="Escherichia coli"

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/protein_id="AAA16375.1"
/db_xref="G1:453986"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /db_xref-"taxon:562"
                                  coli K12 BHB2600.
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/transl_table=11
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                                                                Escherichia
                                                                                                                                 Escherichia.
                                                                                                                                                                                                                                                                                                 Unpublished
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RSLTRRRRFARPLAAFLFIAFIASHVVYIWADANFYRPITMQRANLPLSYPMTARRFL
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QTTLNNGVLQVYGAANDTIKGGRLIVEKDGGAVFVAIEKGGLLEVKEGGFAFAVDQK
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SDVFALIDAGADGYLLKDSDPEVLLEAIRAGAKGSKVFSERVNQYLREREMFGAEEDP
FSVLTERELDVLHELAQGLSNKQIASVLNISEQTVKVHIRNLLRKLNVRSRVAATILF
                                 /translation~"MPQISRYSDEQVEQLLAELLNVLEKHKAPTDLSLMVLGNMVTNL
INTSTAPAQRQAIANSFARALQSSINEDKAH"
11429. .13189
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 KOMPALAGFAEONI SFTRHMSSGNTTONGIFCLFYGISPSYMDGILSTRFPAALITAL
NQOCYQLGLFSSDGFTSPLYRQALLSDFSMPSVRTQSDEQTATQWINWLGRYAQEDNR
WFSWVSFNGTNIDDSNQQAFARKYSRAAGNVDDQINRVLNALRDSGKLDNTVVIITAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RGIPLSEEEFFPWSHGHLQVPLVIHWPGTPAQRINALTHTDHTDLMTTLMQRLLHVSTP
ASEYSQGQDLFNPQRRHYWVTAADNDTLAITTPKKTLVLNNNGKYRTYNLRGERVKDE
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VMEDTQAIDTILDKHATMQSLGKDTGTKVQANAVYDLGRSYQNGSITYSSKAISENMV
INNGRANVWAGTMVNVSVRGNDGILEVMKPQINYAPAMLVGKVVVSGGASFRTHGAVD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                EKHGLLDAQEYQRRLIEQGNPDAVSVQYPLSELRYRDMGTGQNVLLITVDGLNYSRFE
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start codonmay be missing some of N-terminus"
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17523. 18200
/note="regulatory protein narp"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /note="codon recognized: CCC"
/product="tRNA-Pro"
13264. .13346
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complement(18411. .19463)
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Rhodobacter cc12"
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/protein_id="AAA16386.1"
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/transl_table=11
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TKPAVLEVITPTQVRLTISEGRYHQVKRMFAAVGNHYVELHRERIGGITLDADLAPGE
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*protein_ad="AA16407.1"

/db_xref="GI:605943"

/translation-"MMARRSNAVRPLTIISHOHQTGGINIQPPRRMQFPRYRFIKKIE
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NLDAFQGEFSLLIVDECHRIGDDEESQYQQILFHLTKVNPHLRLLGLTATPFRLGKGW
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /translation-"MSLDINOIALHQLIKRDEQNLELVLRDSLLEPTETVVENVAELH
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PESTRYLTFLKGRVGRKVADFFMDFLGASEGLNAKAQNRGLLQAVDDFTAEAQLDKAE
RQNVRQQVYSYCNEQLQAGEEIELKSLSKELAGVSEVSFTEFAAEKGYELEESFPADR
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /note="probably not expressed; yejD on opposite strand has better dicodon usage"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NGLESEADLNRELKKQQRITPHIISQIMEFAATRKGVMIFAATVEHAKEIVGLLPAĒD
AALITGDTPGAERDVLIENFKAQRFRYLVNVAVLTTGFDAPHVDLIAILRPTESVSLY
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      HRWVIRVVRGANIALRLIEHEVTWTVLLRQRVATVSDIMFRKQFERCITDDFAIDGDT
IAADFTPGNSTANAELLCDKFIKSHVCDFACKNGGRALTRKSELLSAQYSGLITSLKG
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// note="match to ORF from B.subtilis; weaker match to ORF
from Buchnera aphidicola and orf near centisome 89"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         7685. .8896
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restriction-modification systems"
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8812. 9162
/gene="yej] -- may be frameshift fragment"
9117. 9446
/gene="yejJ -- may be frameshift fragment"
9571. 9861
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CDS

CDS

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icter helB and corresponding plastid proteins"
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AGVSYYOTGKYOQYKTWQQAPALLDRALDPKADPLNEEEMSRIALGMRTOLQKN
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COMPLEMENT (19460 . 20017)
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/note="may be part of aeg-46.5 operon; strong match to ccll from Rhodobacter and corresponding plastid proteins"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         complement(22636...22977).
//gene="yejr -- may be frameshift fragment"
complement(22881...23372)
//note="homolog of helc from Rhodobacter; probably part of aeg-46.5 operon"
                                                                                                                                                                                               complement(19460. .20017)
/note="probable thioredoxin; may be part of aeg-46.5
operon"
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/note="possible ferredoxin; GTG start codon; may be part
of aeg-46.5 operon" complement(25281. .25790)
//orde="may be part of aeg-46.5 operon; match to
periplasmic nitrate reductase B subunit (napB) from
Alcaligenes eutrophus; weak match to Human guanylate ಭ complement(25766. .26629) /note="may be part of aeg-46.5 operon; weak match

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SKGKRRVALLLALABERDIILLDEWAADQDPFRREFYQVLLPLMQEMGKTIFAISH
DDHYFIHADRLLEMRNGGLSELTGEBERDAASRDAVARTA"
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EALADQVAMSPFHLHRLFKATTGMTPKAWQQAWRARRLRESLAKGESVTTSILNAGFP
DSSSYYRKADETLGMTAKQFRHGGENLAVRYALADCELGRCLVAESERGICAILLGDD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /profein_id="AAA16402.1"
/db_xref="G1:414051"
/db_xref="G1:414051"
/translation="WTWPERLEGVAGESSNGWNNAGTGHSALMELNYTPQNADGSISIEKAAINIEAFOISROFWAHQUERGVLRTPRSFINTVPHMSFWGEDBVNFLRARYAALQOSSLFRGMRYSEDHAQIKEWARPLWEGRDPQOKVAATRTEIGTDVNYCEITRQLIASIQKSNFSLQLSSEVRALKRNDDNTWTVTVADLKNGTAQNIRAKFVFIGAGGAALKLL
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complement(34023. .35666)
. Anote="ABC-type ATP-dependent transport protein. Match to
syrb from Pseudomonas syringae over most of length and
outside ABC-family signatures."
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/db_xref="G1:405945"
/db_xref="G1:405945"
/tb_xref="G1:405945"
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/Franslation="MidleAddePuQEPLAAGAVILRRFAFNAAMPQSFHNLCQR
/Franslation="MidleAddePuQUEQTILRRYAPGATINGATHRQGYLYSPIDPQTNRPWPAMPQSFHNLCQR
/AATAAQYPDFQPAGTLINRYAPGAKLSIHQDRDEPDLAAPIVSWSLGLPAIFQPGGLK
/RNDPLKRLLLEHGDVVVWGGESRLFYHGIQPLKAGFHPLTIDCRXNLTFRQAGKKE"
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OALKTIPCGETVSYQQLANAIGKPKAVRAVASACAANKLAIIIPCHRVVRGDGTLSGY
RWGVSRKAOLLRREAENEER"
36978. .37132
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              QËSGIPEAKDYAGFPVGGQFLVSENPDVVNHHLAKVYGKASVGAPPMSVPHIDTRVLD
GRKVVLEGPFATFSTKFLKNGSLMDLAKSSTTTSVNPMMHVAGLDNFDLVKXLVSQVML
SEEDRFEALKEYY PQAKKEDNFKMAQAGOVIKRDAEKGSVLRLGTEVVSDQGGTIA
ALLGASPGASTPAPIMLALLEKVFGDRVSSPQWQATLKAIVPSYGRKLNGDVAATERE
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/note="DNA repair protein"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   complement(32159. .33631)
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                                                                                                                                                                                                                                                     /rpt_family="REP/PU"
31875. .31981
/rpt_family="REP/PU"
31973. .32018
/rpt_family="REP/PU"
32030. .32096
                                                                                                                                   /rpt_family="REP/PU"
31814. .31845
                                           'rpt_family="REP/PU"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /rpt_family="REP/PU'
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /product="yojH"
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// Lxrafe="G1:453989"

// Lxrafe="G1:453
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /translation="MSRSAKPONGRRRFLRDVVRTAGGLAAVGALGLQQGTARASGY
KLRPPGALINEARFASACVPRCGGCVQACPYDILKLATLASGLSAGTPYEVARDIFCEMC
EDIPCARVCPSGALDREIESIDDARMGLAVLVDGENCLNFGGPALRCLLSRMFEN"
complement(27319. .29748)
//note="may be part of aeg-46.5" operon; strong match to the
periplasmic nitrate reductase large subunit (napA) from
Alcaligenes eutrophus; GTG start codon"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /protein_id="AAA16401.1"
/db_xref="G1:453990"
/db_x
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KGMKRQVIQLTPQEDESTLKVELLIGQTLEVDCNLHRLGGKLENKTLEGWGYDYYVFD
KVSSPVSTMMACPDGKKEKKFVTAYLGDAGMLRYNSKLPIVVYTPDNVDVKYRVWKAE
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EPAAEAPDEEYDLWLSTGRYLEHWHTGSMTRRVPELHRAFPEAVLFIHPLDAKARDLR
RGDKVKVVSRRGEVISIVETRGRNRPPQGLVYMPFFDAAQLVNKLTLDATDPLSKETD
RCDVCYRECPKIDEAITLELERNTRIGKHARFLPTVHSDACTGCGKCEKVCVLEQPAI
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IVVVEAEDSETLIQTIESVRNVEGVLAVSLVYHQQEEQGEETP"
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/note="probable ferredoxin or Fe-S protein; probably part
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                                                                                                             complement(26839. .27312)
//note="may be part of aeg-46.5 operon; weak match
several proteins with redox functions"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /product-"ecotin (protease inhibitor)"
/protein_id="AAA16410.1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /note="Region: Area of low coverage 2"
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/note="may be part of aeg-46.5 operon"
/codon_start=1
                                                      KVLPLSLAKGELGHHYRFGWLEGNNGKS"
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/note="DNA repair protein"
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/protein_id="AAA16400.1"
/db_xref="G1:405935"
                                                                                                                                                                                                                                                                                                                                                                                                                         /protein_id="AAA16398.1"
/db_xref="GI:405931"
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/transl_table=11
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 KEYWORDS
SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       18340
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   18270
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KAKEVVRREGLAVWITKEGDSFRYMSPQFKSFLVSEKN"

COMPLEMENT(38216...38584)
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/note="Region: Area of low coverage 1"
complement(37530. .38132)
/note="weak match to rnff from Rhodobacter capsulatus"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ATTGTGGATGATCCACTTATGCGACGCGGTGTTCGTCAGTTACTGGAGCTTGATCCTGGCTCTGAAGTG 17590 17600 17610 17620 17630 x 17640 17650
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    90 100 110 120 140 T-CACGACAAGCCAACGCGGGTCATACTGTTCAATAAACCTA
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GCTATAATGCGGC----AATTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GCTCCAGGCCAGGC_TTACTCAGCCGGCAAAC-GTAC---CGGAAAATTTACTATGTGCAGGTTGAAGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ATAACGCCTGAAAATACCATGACGAAAAC---TTC-TTTTA--GAAAACACCGG--GTTGA-GCGATTCAGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TCTACGCAGCGGGACGTCTG-----GATCGCGACAGCGAGGGGCTGCTGGTCCTTACCAATGACG--GCGT
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278
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Mismatches
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/note="outer membrane protein C"
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Matches = 356
Conservative Substitutions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                260
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                                                                         /transl_table=11
/product="yojk"
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/product="ompc"
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Residue Identity
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ORIGIN
                   CDS
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Bacteria; Firmicutes; Bacillus/Clostridium group;
Bacteria; Firmicutes; Bacillus/Clostridium group;
Bacillus/Staphylococcus group; Bacillus.

I (bases 1 to 218470)

Runst, F., Ogasawara, N., Moszer, I., Albertini, A.M., Alloni, G., Azevedo, V., Bertero, M.G., Bessieres, P., Bolotin, A., Bronchert, S.C., Borriss, R., Boursier, L., Brans, A., Braum, M., Brignell, S.C., Broniller, S. Breoni, J.J., Connerton, I.F., Capuano, V., Cardwell, B., Capuano, V., Carter, N.M., Choi, S.K., Codani, J.J., Connerton, I.F., Cummings, N.J., Daniel, R.A., Denizot, F., Devine, K.M., Puster, C., Ferrari, E., Froulger, D., Fritz, C., Fujita, M., Fujita, Y., Fuma, S., Galizzi, A., Galleron, N., Ghim, S.Y., Glaser, P., Goffeau, A., Golightly, E.J., Grandi, G., Guiseppi, G., Guy, B.J., Haga, K., Haiech, J., Harwood, C.R., Henaut, A., Hilbert, H., Holsappel, S., Hosono, S., Hullo, M.F., Itaya, M., Jones, L., Joris, B., Kammata, D., Kasahara, Y., Koningstein, G., Krogh, S., Kumano, M., Kurita, K., Lepidus, A., Ladinois, S., Lauber, J., Lazarevic, V., Lee, S.M., Lein, C., Masuda, S., Mauel, C., Medina, N., Mellado, R.P., Mizuno, M., Moestl, D., Nakai, S., Noback, M., Persecan, E., Pulic, P., Purnelle, B., Rapoport, G., Rey, M., Persecan, E., Pulic, P., Purnelle, B., Rapoport, G., Rey, M., Reynolds, S., Rieger, M., Persecan, E., Pulic, P., Purnelle, B., Rapoport, G., Rey, M., Reynolds, S., Rieger, M., Puller, B., Park, S., Rieger, M., Persecan, E., Puller, P., Puller, P., Purnelle, B., Rapoport, G., Rey, M., Reynolds, S., Rieger, M., Persecan, E., Puller, P., Parkor, M., Persecan, E., Puller, P., Parkor, M., Persecan, E., Puller, P., Parkor, M., Persecan, E., Puller, P., Puller, P., Parkor, M., Persecan, E., Puller, P., Puller, P., Parkor, P., Pa
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Bacillus subtilis complete genome (section 13 of 21): from 2395261
c 26311330.
299116 1 GI:2634723
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AAGGCAGCAAGTATTTAGCGAAGGCGTCAATCAGTACGTGAACGTGAAATGTTTG-GCGCGGAAGAA
17930 17940 17950 17960 17960 17970 17980
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299116 TOIG of: 299116 check: 4068 from: 1
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Bacillus subtilis
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TITLE

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VRETRLALITNELGQEVLCYEMLGTIENDTFRMYINAKDSSEKVEKLNAEPIYKDL
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VKWLTLSLVVPSLLHGSYDFILLTALSNWIYYMLPFWVFLWWFGLRKAKKARSVNMMQV
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complement(1711. .3094)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /note="similar to thioredoxin reductase"
/codon_start=1
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/codon_start=1
                                                                                                                                                                                                                                                                                                                             /note="alternate gene name: joeB, yzuA similar to hypothetical proteins" /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /note="alternate gene name: ypeA"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /gene="sleB"
complement(3129. .4046)
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                                                                                                                                                                                                                                 complement(1742. .3094)
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                                                                                                                                              terminator
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Rivolta,C., Rocha,E., Roche,B., Rose,M., Sadaie,Y., Sato,T., Scanlan,E., Schleich,S., Schroeter,R., Scoffone,F., Seklguchi,J., Sekowska,A., Seror,S.J., Serror,P., Shin,B.S., Soldo,B., Sorokin,A., Tacconi,E., Takagi,T., Takahashi,H., Takemaru,K., Takeuchi,M., Tamakoshi,A., Tanaka,T., Terpstra,P., Tognoni,A., Tokeuchi,M., Vannier,F., Vassarotti,A., Yolari,A., Wambutt,R., Wedler,E., Wedler,H., Weitzenegger,T., Winters,P., Wipat,A., Yamamotch,H., Yamane,K., Yasumoto,K., Ya
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Roux, 75724
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Kunst, F., Ogasawara, N., Yoshikawa, H. and Danchin, A.
Direct Submission
Submitted (188-NOV-1997) I. Moszer, A. Danchin, Institut Pasteur,
Regulation de 1'Expression Genetique, 28 rue du Docteur Roux, 7572
Baris Cedex 15, FRANCE. E-mail: moszer@pasteur.fr,
adanchin@pasteur.fr Phone: +33 (0)1 45 68 84 41, Fax: +33 (0)1 45
68 89 48
                                                                                                                                                                                                                                                                                                                                                                                                                                  The complete genome sequence of the gram-positive bacterium Bacillus subtilis
Nature 390 (6657), 249-256 (1997)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /note="alternate gene name: jofc, ypfC"
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TITLE
JOURNAL
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REFERENCE
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13703. 13951
13703. 13951
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complement (7449) . 7464)
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BETMETNVEGVFIAGSTRAFLITENGFFN
COMPLEMENT (5995. . 6016)
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Marayteleferangflavevyslorogwylytrkodradsedderodbylekode
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Eygnpflitrlogesgklimosnaverlothes complement (8223. .9002)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         complement(9057. .9082)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      complement(9088. .9531)
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/function="unknown"
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                                                                                                                                                                                       /gene="ypcA"
                                                                                                                                                                                                                                   /gene="ypcA"
                                                                                                                                           /gene="ypcA"
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                                                                                                               terminator
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      terminator
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IPTFIDEVEIKEKPKOKELSIRVHOPATAFSIKDDTLLKKLLKESLKWSPYEKVKFLS
DQNETGVRIGSYGTFTEISIRKOSKRSYTLYQNKOGDFLVPSNHSFDTYKRAIKEME
SSQEDTTPLIQAGAVOSYTKKOKHLYMRFSKESEVDDSIAGILMIEGLLLTAKEFGF
TEVTFTETRYKKIGKYDISDAIPVPAAPNPISLN"
COMPLEMENT (18601. .19185)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /product="two-camponent sensor histidine kinase"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /function="activation role in global regulation of aerobic and anaerobic respiration (resA, ctaA, qcrABC, fnr)" /note="alternate gene name: ypxD"
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VQHENVREISCALDQCTIDQRAVIILRFIQGYSIQETAKALRFSESKVKTTQHRGLKV
LRKHWELLREELMDBVRWERRFDKGVVKSTSGS"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       IPILTQDEIGELATAFNQMGRQLNFHINALNQEKEQLSNILSSMADGVITINIDGTIL
YMTPPARETCAMY ZEQNMIKEGDNILPEARELLEQNNYSTEREQMIEMTLQGRSWYL
LMSBLYAESHYGAAVALRDMTEERRLDKTERDFIARD
DIASSEEDRKEIAQIIYDESLRMGRLVNDLLDLARMESGHTGLHYEKINVBFLEKII
VEWRVDVFEKANDREAVTKLISKLRKSLEDKLFLFFTHKEGGSMEMDESSYLALLE
SAGTOKTDLDLIDIELESGADANVKALVSCLAEENNYVYWSNHDFEKTPVKDEIISRLRK
MODIGAHIRKMAVMPUDTGDLLTLLDATYTMKTIYADRPITTMSMAATGLISRLSGEV
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TSFVVPEKEQDNYITVAVADADTSAIIPVSIQKTNADQTIQDMLFESSELGILDHAIT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     RKFSGVAKEKNIALDHDISLTEEEFWFDEDKMEQVFTNLIDNALRHTSAGGSVSISVH
SVKDGLKIDIKDSGSGIPEEDLPFIFERFYKADKARTRGRAGTGLGLAIVKNIVEAHN
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/db_xref="SWISS-PROT:P35165"
                                                                                                                                                                                                                                                                                                    /note="similar to negative regulator of sigma-X activity"
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complement(join(17540. .17555,17559. .18665))
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                complement(join(19326. .19346,19389. .21158))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /note="alternate gene name: ypuM"
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                                                                                                                                                                                                          complement(17559, .18665)
/gene="ypun"
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/gene-"sigx"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            complement(21155. .21877)
                                                                                                          complement(17540. .17555)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /codon_start=1
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /gene="resD
                                                                                                                terminator
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GMTVHVFDPFLTEERAKKIGYNSRTFEEVLESADITTVHTPLTKETKGLLNKFTTAKT
KKGYRLINGARGGILDEAALLEALENGHVAGAALDVFEVEPPVDNKLVDHPLVIATPH
LGASTKEAQLNVAAQVSEEVLOFAKGLPVMSAINLPAMTKDEFAKIKPYHOIAGKIGS
LVSQCWKEPVQDVAGTYRETSFIFFALLSGFLKPRVDSTVNEVNAGGVAKER
GISFSEKISSSESGYDNCISVKVTGDRSTFTVTATYIPHFGERIVEINGFNIDFYPTG
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VEVPEVLEEDMIDAFEGCPTDSIKVADEPFEGDPLKFE"
complement(13967. .14563)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  HLVYIQHQDTTGVIGRVGRILGDNDINIATMQVGRKEKGGEAIMMLSFDRHLEDKIVK
ELTNVPDIVSVKLIDLP"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TFAMISSLMRHIPQANISVKSREWNRTAYVGSELYGKTLGIVGLGRIGSEIAQRRGAF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /translation="MNVLTIKGVSIGEGMPKIIIPLMGKTEKQILNEAEAVKLLNPDI
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/gene="ypzE"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          complement(16680. .17447)
/gene="aroC"
                                                                                                                                                                                                                                                                                                                  complement(13991. .14563)
/gene="ypaA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               complement(16680. .17447)
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15060. .16637
/gene="serA"
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                                                                                                                                                                                                                                                                     terminator
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gene

CDS

gene

CDS

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SDQIEVNGLKVEREEPVYFLLYKPRGVISAAQDDKGRKVVTDFFKNIPQRIYPIGRLD
YDYSGLLLTYNDGEPANKLMHRKYEIDKTYVAKVKGIPPKELLRKLERGIRLEBGKTA
PREAKLLSLDKKKOTSIIQLTIHEGRNRQVRNFEAIGHEVIKLKREEYAFLNLRGLH
TGDARELRLTK"
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AFSHYPLFSRNACRYNCFOIHPGALDFIMDLLKPAFSAIGIPAEVPLALIRFISGTA
ALGWTTDLIYVEDPSFIGGLASVMQGSTDTTLYVLTVYFGAVGIKKMGDALKVGLLA
DLIGVVASIIIVTLFESA"

complement(26779. .27369)
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MSVLVFWLGIAKIAEQSGLDIFSRMORPFISKIFPDIPPDHPAMGYILSNLAANFFG

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/gene="dac8"

complement(27357. .28505)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              HENHYSTAYDMAILTRYAMKIKDYQKISGTKIYKAETMESVWRNKNKLLTMLYPYSTG
GRYGYTKLARRYLVSTASKOGIDLIAPYINDPUMBWRNENFYEFERYGYLIAKKG
DIPKLKGTFYESKABT KRDITYLITEEEKENVKINTILLKPKKAWEKDASKIPDIVGH
MEIMFNDATIAKVPIYYENERHQKPKKOFFETFKSIFLNAAGGAKWSI"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         KLKDLVYGLMLRSGNDAAVAIAEHVGGSLDGFVYMMNQKAEQLGMKNTRFQNPHGLDD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /translation="MRIFKKAVFVIMISFLIATVNVNTAHAAIDVSAKSAIIIDGASG
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /note="similar to hypothetical proteins from B. subtilis"
/codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /function="required for spore core dehydratation"
/note="alternate gene name: ypuK"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /EC_number="3.4.16.4"
/function="required for spore cortex synthesis (peptidoglycan biosynthesis)"
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(penicillin-binding protein 5*)"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                terminator
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complement (32363. .33559)
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                                                                                                                                                                                                                      "gene="ypuD"
                                                                                                                                                                                                                                                                                                                                                                                                                                          IDGLIKVAKVND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /gene="sipS"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /gene="sips"
                                                                                                                       'gene="ypub"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /dene="ypuB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      'gene="ypuB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /gene="ypuc
                                                                                              terminator
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complement(47398...48165)
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/ String of the strin
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LERSGWGFTTRENFMDDVSIDSSPEMGTTIRLTKHLSKSKALCN"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /translation="MSLGIDMNVKESVLCIRLTGELDHHTAETLKQKVTQSLEKDDIR
HIVLNLEDLSFMDSSGLGVILGRYKQIKQIGGEMVVCAISPAVKRLFDMSGLFKIIRF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /product-"RNA polymerase sporulation-specific sigma factor
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /function-"binding to sigma-F (SpoIIAC) in the presence of ATP before septation; phosphorylation of SpoIIAA (stage II
FVQAYEAAVILGAVCGGWETLHMNHLYLTKWIAVPVGLLAGLFVGMLAAALTEVLNVL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /product="anti-anti-sigma factor (antagonist of SpolIAB)" /protein_id="CAB14279.1" /db_xref="GI:2634782"
                                                                                                                                                                                                                                       production of immature spores
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /codon_start=1
/transl_table=11
/product="anti-sigma factor (antagonist of sigma-F) and
serine kinase"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /gene="sigF"
/function="early forespore-specific gene expression"
/note="alternate gene name: spoIIAC"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        to SpoIIAB in the presence of ADI forespore (stage II sporulation)'
                                 PILAKRIGLRSKIIILLMAIVIGKIAGSLFHWLYFIDHS" complement(46674. .47276)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /gene="dacF"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /db_xref="SWISS-PROT:P10727"
                                                                                                                                                                                                 /gene="spoVAA"
/note="mutants lead to the
(stage V sporulation)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /gene="spoIIAB"
complement(48177. .48617)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        complement(48614. .48967)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        complement(48614. .48967)
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                                                                                                                                                           complement(46674. .47276)
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/function="binding to selectively in the forcodon_start=1
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fylhffpfnektagnptaatlilisalltgegiydrigofagagsaypytgfansmas
aaleykseglylgyatnmfklagnylyfgyvaayiygmirfafekims"
                                                                                                                                                                                                                                                                                                                  EIQLYYLNGLCDTAYIHLMRELVAINNRKEDPDELVDIVENRLLNAQVEKVKTLDET
TDQVLSGLVAVIVEGAGFAFIIDVRSYPGRNPEEPDTEKVVRGARDGFVENIVVNTAL
LRRRIRDERLRVKMTKVGERSKTDLSICYIEDIADPDLVEIVEKEIASIDVDGLFMAD
                                                                                                                                                                                                                                                                                                                                                                                                                                KTYVEEFIVNOSYNPFPLYRYPERELDYAANHYLEGHVIIVDTSBYXITTEFHYD
HAEEYRQAPSVGTFLRWYRFFGILASTLFLPIWFLFVLQPDLLPDNMKFIGLNKDTHI
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LAAIGTFTTPSYELSLATHPPSCPHDTRCFISYKRARHRIYSANYAMASIKSLQTPYL
WPLIPPNGKALWQVLKTAKPGARVPSIVHPKNRLRQPTNS*
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KTHQAEWTRVDVSIENBKGETTEYGVDKVGEREFDDHAMSGDVYCLDKLDLPLTGIG
DIGKMGRKDDISKGSPITMKAVEFILERSGYHAGPQGRENSGLSESS"

COMPLEMENT (44746 . .45762)
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FLCMFGACSTSMETVAVASALVDGGFAKRALAATSSHNATAEROFRYPTEYGGQKPDT
ATSTVTGSGAVVISQTPGDIQITSATVGKVSDLGITDPFDMGSAMAPAAADTIKQHFK
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SGCACSAVVTYSHIFKQLREGKLNRVFVVATGALLSPTMIQQKETIPTIAHGVVFERA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               complement(44746. .45762)
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/note="mutants lead to the production of immature spores
(stage V sporulation)"
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                                 /note="mutants lead to the production of immature spores (stage V sporulation)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /gene="spovAE"
complement(43773. .44744)
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/transl_table=11
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FGAVDEIEGDLLEDVEEIIERDWRFKIKDHRLTFHGICHRCNGKETE"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /translation-*MRKISYKOMFLRHYKDHLSLYIFVSVLFFMGVIFGAIIVNSMTI
SQKEDLYYYLSOFFGQLSDGKQASSADMFGQSIFHNAKYLGLMWILGISVIGNPIIFI
HIKGIVQFTVGFTVGFLVGNGWGSGFFLSFVSVLPQNVLLIPAYLIMGFCAIAFSLKLI
RQLFVKRSLHDAPLQMFGRYAFVLLVILFLALISSLFEAYLSPVLMEKLTSRLF"
complement(55116..55331)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /translation-"MTAKHMIRTLMIETPSVPGNLGRVATAIGLLGGDIGEVETVKVG
PNYTMRNITVQVENEEQLQEVIAAVQALGEGIRLHTVSDEVLSAHEGGKIQMKSKMPI
RSLAELGRYYTPGVADVCRLIEKEPERASIYTTINYOTAILGLGNIGSVAG
MPVMEGKAALFDQAGISGIPILLDTSDPEETIKTVKHISPGFSGILLEDIGSPHCFE
IEDRIKEELMIPVMHDQHGTAVYTLAAAISACRSAGVDLKEAKVGGIGLGAAGVAIC
RMFMAYGVNAVYGTDKSESAMNRLEQYGGQAVSSIEELMETCDIVIATTGVPGIIKPA
FVYSGQVIIALSNPREDIEEPRAALQAGAAYAADGRSWNNVLGFPGIFGGALNAKSTEI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /translation="MAKSQAKKRGHRLRNGGRDVLLSRGSTPSFSTHGRMTKSKKEI
LNKRKHKNPYDHTAVDDKDFFVPQKAA"
complement(55396. .55419)
                                                                                                                                                                                                                                /note="similar to transcriptional regulator (Fur family)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /gene="spoirm"
/function="required for dissolution of the septal cell
wall (stage II sporulation)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NHDMLVAAAEAIAACTKQGDVVPQPLDSKVHHAVAAAVEHAALTAVK" complement(56768. .58174)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /note="similar to malate dehydrogenase"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /note="similar to Na+/H+ antiporter"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /protein_id="CAB14285.1"
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                        complement(53771. .54258)
                                                                               complement(53771. .53791)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          complement(54371. .55015)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   complement(54371. .55015)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /gene="yqkJ"
complement(55396. .56750)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                complement(55431. .56750)
/gene="yqkJ"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               .58174)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /protein_id="CAB14286.1"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /protein_id="CAB14287.1"
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YTHVTKTRLKDVYKQFHPRA"
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                                                                                                                                                                                                     /function="unknown"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /function="unknown"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         'function="unknown"
                                                                                                                                           53809.
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                                                                                                                                                                                                                                                            /codon_start=1
/transl_table=11
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /gene="spoilM"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /codon_start=1
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /gene="yqkI"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /gene="ygkK'
                                                                                                                   /gene="yqkL
                                                                                                                                                                          /gene="yqkL
                                                                                                                                           complement(
                                                                                  terminator
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VAELLYTUNAAGGVNTEFRAGDLMITTDHINEMGTNELIGPNEADFGARFPDNSSAYDK
DLSSLAEKIAKDLNIPIQKGVYTAVTGPSYETPAEVRFLRTMGSDAVGMSTVPEVIVA
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COMPLEMENT (51215. .52399)
                                                                                                                                                              /translation-"MKRLLSTLLIGIMLITFAPSAFAKODGKRTSELAHEAKSAVLIE
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                                                                                                                                                                                                                                                   FKNPTGLTEEGHYSSAYDMAIMAKELLKYESITKFTGTYEDYLRENTDKKFWLVNTNR
LIKPPGVDOSVYGTYTGEAKKCLTASAKGNNRATANVEGASTPKERNAQYTKULDFA
FSQYETHPLYKRNQTVAKYKVKKGKQKFIELTTSEPISILTKKGEDNNDVKEIKMKD
NISAPIQKGQELGTLVLKKDGEVLAESPVAAKEDMKKAGFITFLKRTMODWTKFFK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /translation="MORAYKYRRVELTYMDSVGIGEAPDAADFNDEGAHTLGHIAEHMN
GLHHPNMAKLGLGILEDIKGYEKTEHPLAYYGKLQEASNGKDTWTGHWEIMGLYIDKP
KYFPEGFPDELLQELEKRSGRKIIGNRFASGTRIIDELGGEMETGALIYYZSADSV
LQIAAHEEVVPLEEGELKRICETARTLTLDPKYWYGTIARPYGEPGFKRTPNTHDYA
LKPFDRTVMNELKDCGLDVISIGKISDIYDGEGITSSRRTVSNMDGMDKVIDTLGEDF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /function="cleavage of guanosine or inosine to respective bases and sugar-1-P molecules (purine nucleoside salvage)" /note="alternate gene name: yqk0"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DWNHYTRIHIIQYLKHLKDSCKSGKTSARHLASIRSFHQFLLREKVTDKDPSVHIETO
KTERALPKVLALNEVERLLDTPKLTSPFGYRDKAMLELLYATGIRVSEMIELKTADVH
LSMGFIRCFGKGRKERIVPIGEAAASAIEEYMTKARGKLLKNNVSDALFLNHHGKQIS
RQGFWKNLKKIALEAGIKKELTPHTLRHSFATHLLEDGADLRAVQEMLGHADISTTQI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /translation="MKDRIERAAAFIKQNLPESPKIGLILGSGLGILADEIENPVKLK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          IHHGTDHTREYVPILAYSKKHKKAQMLPLADTFADIGATIADNFQTNKPKYGKSFLSL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /translation="MKDQIKDFIHYVWVERGLSQNTIVSYERDLKSYSLYLTETLHVT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TGLSFANLVDFDALFGHRRDPEGYGRALEEFDARLPEVFGKMREDDLLIITADHGNDP
               /product-"D-alanyl-D-alanine carboxypeptidase (penicilin binding protein)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /function="conversion of ribose-1-P/deoxyribose-1-P to
ribose-5-P/deoxyribose-5-P (purine nucleoside salvage)"
/note="alternate gene name: yqkN"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /product="purine nucleoside phosphorylase"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /transl_table=11
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/protein_id="CAB14282.1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /note="alternate gene name: ykgM"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /product="integrase/recombinase"
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                                                                                                                                     /db_xref="SWISS-PROT:P38422"
                                                                                                                                                                                                                                                                                                                                                                         complement(50333. .50362)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          complement(50387. .51202)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         complement(51215. .52399)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              .52560)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /EC_number="2.4.2.1"
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                                                                                                                                                                                                                                                                                                                                                                                                                                complement (50333.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        complement (52543.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /gene="ripx"
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                                                                                                                                                                                                                                                                                                                                                                                                        /dene="pnp/
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KLTKITAFYTSPGFADEIVHVFLAEELSVLEEKRELDEDEFVEVMEVTLEDALKLVES
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64224 . 64245
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LEDLGGWNYLIYDHRRHGGGGGKTTSYGFYEKDDLNKVYSLLKNKTHHRGLIGTHGES
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /translation="MKKILLAIGALVTAVIAIGIVFSHMILFIKKKTDEDIIKRETDN
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/note="similar to hypothetical proteins"
                                                                                                                                                                                                                                                                                                                                                                   proteins"
                                                                                                                                                                                                                                                                                                                             /function="unknown"
/note="similar to hypothetical
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                EQIRKKKEIEKNKSFEELLNESQMDWHQYK"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 EHAMSYTKNRHTYRKTVQEFLDNMNDSTE'
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Gapes—YQKF"
63295. . 64215
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /gene="yqkD
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              KQSRQHLYEVNMGATAVGTGLNADPEYIKQVVKHLADISGLPLVGADHLVDATQNTDA
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complement(59787, .60776)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /note="alternate gene name: yqkH similar to hypothetical proteins'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /db_xref-"SWISS-PROT:007683"
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COMplement(58315. .59742)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       complement(59787. .60776)
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                                                                                                                                                                                                                                                                                                                                                                                                                                        complement(58315. .59742)
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gene

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                                                                                                                                   complement(68531. .69769)
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70690. .71922
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71940. .72131
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ITSEHNSWTGFLIGFQSQSDPETAYIHFSGVHPDFRRWQIGKQLYDVFIETVKRGCTRVKCVTSPVNKVSIAYHTKLGFDIEKGTKTVNGISVFANYDGPGQDRVLFVKNI"
complement(68196. .68534)
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                                                                                                                                                                                                  complement(65842. .66165)
                                                                                                                                                                                                                                              complement(65842. .66165)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             complement(66162. .67193)
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/gene="yqjy"
complement(67540. .68010)
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complement(67186. .67530)
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KQPEKLRKEITSPGGTTEAGLRALQDSRFEEBAIHCIEETAKRSAEIKEGFAGAALER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LLITYPDEEVNSRGMIEAVPALKEMEKKHDITLTACLNAEPMFEKFPGDQQQYFYTGS
IGTVLAGFFCKGIETHYGEPFSSLNARNASAENTRLLELNADVCEKYDGSTYPPPVNL
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FQQFEPFQPIERDVTVLTFDELVSRAKKRAGISETERALNYAFANRGELGDRDFSTKI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               VSĒLASLČKEDAPLIVLFYSPPLYPAVSKDDOLIRNTADQIKHYAAERYGIALREVQ
YFPGLSDLSYLQLEKQEVDAYTSNMPLFNRGYSLPSGKNQALYVPVLNVGPAGKDPHK
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     FQKHPDDVTPHPMDDGRSFLTALVKKKNVKKTVLLLSHFDVVDIEDYGEFKHMACKPA
ELLSSFLEKKELLPERVRRDAESGDWLFGRGTMDMKAGLCIQLSMLERAMNGHFEGNL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        IEIHAAHGYLIHEFLSPLSNHRTDEYGGSPENRYRFLREIIDEVKQVWDGPLFVRVSA
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /note="similar to NADH-dependent flavin oxidoreductase"
                                                                                                                                                                                             pyrroline-5-carboxylate reductase*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /note="similar to amino acid degradation"
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                                                                                                                                                                                                /note="similar to
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PVQLFSTEEGRRYAQKYKMEHAVHVVWGTGGSMVPKDEMAAYNRIGADLLKKRNGK"
complement(74971. .75750)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AAIFTKKREINLPRLMNAGTKLYQLFPALVEKLAGRALMKK" complement(75756. .76715)
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                                                                                                                                                                                                                                                                                                                                      'note="similar to pantothenate kinase"
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                                                                                                                                                                                             complement(72518. .73399)
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83125. G84635
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ISTERPFIWIADFYTSVFRGTPLVLQLMIVYFGLPQLLGFQIDQFWAAVVALSLNSAA
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SAIVTVIGLGDVMRRAYQAGAATYNYLEPLIIAGLIYYVLVLILTFIGKAVERKLKSN
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COMPLEMENT (97001. 97471)
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                                                                                                                                                                                                                                                                      /note="similar to amino acid ABC transporter (permease)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /note-"similar to amino acid ABC transporter (binding
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /product="multidrug resistance protein"
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                                                                        complement(95258. .95917)
                                                                                                                                                     complement (95258. .95917)
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/transl_table=11
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complement(92922. .93452)
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FEEMPLPATREEFFRARALFHLLGEMEOYLVIKSYFKGIKADMRKE

FEEMPLPATREEFFRARALFHLLGEMEOYLVIKSYFKGIKADMRKE
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                                                                                                                                                                                                                                                                      GPCAGGAVYSPALTDFIFMAEQTGRMFITGPKVIEKVTGEQVDAESLGGAGIHNAVSG
                                                                                                                                                                                                                                                                                                                                                                                                                               AYGGAYVAMNSKAIGADLVFAWPNAEIAVMGPEGAASILYEKEIKASADPQKTKREKT
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complement(92298. .92720)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /note="similar to hypothetical proteins" /codon_start=1
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complement(93504. .94472)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /note="similar to dihydrolipoamide dehydrogenase"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /note="similar to leucine dehydrogenase"
                                                                                                                                   /note="alternate gene name: bfmBla"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PGENELQSLAQGALRVLQGEEQSKQYRIE"
complement(106635, .107729)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /db_xref="SWISS-PROT:P54531"
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complement(104131. .105504)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          complement(104131. .105504)
complement(103065. .104057)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     complement(105525. .106616)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           complement(105525. .106616)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /gene="Yqir"
complement(106635. .107729)
/gene="Yqir"
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                                                                                 /EC_number="1.2.4.4"
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/function="unknown"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /transl_table=11
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                                             /gene="bfmBAA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /codon_start=1
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SPASNAF"
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CDS
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /translation-*WEESYYSIGEVÖKLANVSIKALRYYDKIDLFKPAYVDEDTSYRY
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ESADGETHUNSYGAFFSEQPYTSIDEMYRHIFTPVLINKGISSITPDMEITTIPKGRY
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LGGISAPFIMPGVTAFIADITTIKTRPKALGYMSAAISTGFIIGPGIGGFLAEVHSRL
                                                                                                                                                                                                                                                                                                                                                                         FGLASFESLFALFVDHKFGFTASDIAIMITGGAIVGAITQVVLFDRFTRWFGEIHLIR
YSLILSTSLVFLLTTVHSYVAILLVTVTVFVGFDLMRPAVTTYLSKIAGNEQGFAGGM
NSMFTSIGNVFGPIIGGMLFDIDVNYPFYFATVTLAIGIALTIAWKAPAHLKASI"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AKSAGAADQPNKKRYSPAVLRLAGEHGTDLDQYTGTGAGGRITRKDIQRLIEFGGVQE
QNPEELKTAAPAPKSASKPEPKEETSYPASAAGDKEIPVTGYRAIASNMKRSKTEIP
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QGGTFFYNNTGSFGSVOSMGIINYPQAAILQYESIVKRPVVMDNGMIAVRDMYNLCLS
LDHRVLDGLVGGRFLGRVKQILLESIDEKTSVY"
complement(102068. .103051)
                                                                                                                                                                                                                                                                                                                                PFFFAAAFALLAAILSILTLREPERNPENQEIKGQKTGFKRIFAPMYFIAFLIILISS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /product-"branched-chain alpha-keto acid dehydrogenase E2 subulit (ilpoamide acyltransferase)"
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/db_xref-"G1:2634837"
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VNAEVPSSFTGTITELVGEEGOTLQVGEMICKIETEGANPAEGRKOEQPAASEAARNPV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /translation="MSYMSYIDAINIAMKEEMERDSRVFVLGEDVGRKGGVEKATAGL
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YRSNNDWSCPIVVRAPYGGGVHGALYHSOSVEAIFANQPGLKIVMFSTPYDAKGLLKA
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ISEHCLFDLDAPIKRLAGPDIPAMFYAPTMEKYFWVNPDKVEAAMRELAEF"
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(2-oxoisovalerate dehydrogenase beta subunit)"
/protein_id="CAB14335.1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     99870. .100709
/gene="bmrR"
/function="positive regulation of the bmrUR operon"
                      /product="multidrug-efflux transporter"
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                                                                                                                                                     db_xref="SWISS-PROT:P33449"
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/gene="bfmBB"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            complement(100771. .102045)
/gene="bfmBB"
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/transl_table=11
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/transl_table=11
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 .100709
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /gene="bfmBAB"
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99870. .10070
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DATSRGVHLALMSLKGEMGYPTALSAPGWGFQDVLFNKKEIKLARPLDAYWENVLFW
SYPAEPHOGTRAESAYILHPQVKNRIDEIDRYVRTRHESBARILIKOKOPLHNPADRD
HCLQYITAIGLLFGDTAQHYBAETANDPRIDKLRDKMEVTENKTYEDYLKPDKRSI
SNAVQYHFKDGTSTEMPGCEFPLGHRFRREBAVPKLLEKFSDNLKTHFPDKQHKHIYEI
SNAVQYHFKDGTSTEMPGCEFPLGHRFRREBAVPKLLEKFSDNLKTHFPDKQHKHIYEI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /product-"citrate synthase III"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         LSALAGYDRQIDDRSPSANKERAYQLLGKMPALTAASYRIINKKEPILPLQTLSYSAN
FLYMPYGKALSSLEEQTFPRSLVLYSBIEBMPYSTAARVISASHBGJUGTLGYGALTGAYASL
KGNLHGGALBRAYM LLLEAKTTSDFEQLLQTKLKRREILMGFGHRYYMKKMDPRALMA
KEALQQLCDRAGDHRLYEMCEAGERLMEKEKGLYPNLDYYAAPVYWMLGIPIPLYTPI
FSARTSGLCAHVIEQHANNRLFRPRVSYMGPRYQTKS"

COMPLEMEN (114782. 115918)
/gene="mmgc"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /translation="Herviscop" | //translation="Herviscop" | //t
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ADIYITEALTAADQGRHGISAFIVEKNYPGFTVGKKERKIGLYGSNTTELIFDNAEVP
EANLLGKEGOSFHIAMANLNVGRIGIAAQALGIAEAALEHAVDYAKORVOFGRPIAAN
OGISFKLADMATRAEAARHLVYHAADLHNRGLNCGKEASMAKOFASDAAVKALDAVQI
YGGYGYMKDYPVEKLLADAKVTVQIYEGTNEIQRLIISKYLLGGT"
COMPLEMENT (115946. .116680)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /db_xref="SPTREMBL:032016"
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LDHVLFVKVATTAVAAKLLGGGREEIKNALSNAMIDNAALRTYRHSPNTGSRKSWPAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /function="(butyrate/butanol-producing pathway)"
/note="alternate gene name: yqim"
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/protein_id="CAB14347.1"
/db_xref="G1:2634850"
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/db_xref="GI:2634849"
/db_xref="SWISS-PROT:P45857"
                                                                                                                                                                                                               /note="alternate gene name: yqiP"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             complement(114782. .115918)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /EC_number="1.1.1.157"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /gene="mmgC"
/EC_number="1.3.99.-"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /EC_number-"4.1.3.7"
                                                                                    complement(112197.
                                                                                                                                                                            /function="unknown"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /transl_table-11
                                                                                                                                                                                                                                                                                                   /transl_table=11
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /gene="mmgB"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /gene="mmgD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /gene="mmgD
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                                                                                        CDS
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TDAVELAEEVTNLKQVRTMLEATIOSSDEATSVVDENGIGLLINKATTKMTGLSEKEV
TORVENDESESHLKVLETRRVYRCRRKYGPREKEVTVNVAPVTVDTLKGSVG
VIHVSENALDISESESHLKVLETRRYRCRRKYGPREKEVTVNVAPVTVDGILKGSVG
VIHVSEKAMERAEUNRARQITRTLEAKTFDDITGKSEQMLVALEGAKLGAKTPATI
LLRGESGTGKRELFATHNESDRKYNKFIRVNCAALSENLLESELFGYEDGAKGAKTPATI
GGKKGLFERANNGSTFLDETGELTONMQAKLLRVLQEKETVRVGGTKAIPVRVVIAA
TNVINEKAMAMAGTFREDLYTRINKYTSINKYTSISTPURGKEDISTSCRNV
KGLSQOALRALSAYHWGRVNRELENVLGRAMIFLURHMEWIERDHLEVFELEGKEND
DQGTGFDFPDIEGEKLSVAVEKFEAHLIQQTLEKHHFNRTKTAKALGVSIRNLYTKMD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          LTGDSKKLNELTSSMQGHQVEIVHANTPEESAKLAVRAVHHKTADVLMKGNVPTSVLL
KYLJNRQEGLKSASVLSHVAVFDIPDFDRLMKYTDSAMNIAPSLEELRQILQNAVHVA
HAVGNNMPKAAALAAVETVNPKMEATVNAAALAQMYKRGQIKGCIVDGPLALDNAVSQ
IAAAQKKISGDVAGNPDILLVPTIEAGNILYKSLIYFAKASVAAVITGAKAPIALTSR
ADSAENKLYSIALATGASEEYTH"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /protein_id="CABI4341.1"
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PIKEVIPSTKMPRILKTRVPEYNQKQLLGDHLQITTRLPIIDEGGRLIGALCUFKDI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AGESATYLSGAAYTASRGLPDIGITTSAEIAERAKDIVRAADIPLLVDIDTGFGGVLN
AARTAREMLEARVAAVQMEDQQLPKKCGHLNGKQLVPIKEMAGKIKAIKQAAPSLIVV
ARTDARAQGGLDAAIKRSEAYIEAGADAIFPEALQAENEFRQFAERIPVPLLANMTEF
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/db_xref="SM155-PROT: 574530"

/translation="MKLKDLIGGRASIHKNKTIAVAHAEDEEVIRAVKLAAEHLSARFL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /translation="MSRLLALLILVIPGAISALGIKLMRDTLFGHTIKPFSALWLQGL
SGFIFFAIGLYVLAGFILYRDRKRNQVSPRFRKR"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /translation-"MSWIVNKQSSQEELAGRFRKLMSAPDILQIPGAHDGMAALLAKE
                                                                                                                                                                                                           /note="similar to phosphate butyryltransferase"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /note="similar to phosphoenolpyruvate mutase"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /note="similar to transcriptional regulator (signa-L-dependent)"
/codon_start=1
/transl_table=11
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/gene="yq1R"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     complement(108765. .110843)
/gene="yq1R"
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/gene="yqiQ"
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                                                                               complement(107741. .108640)
complement(107741. .108640)
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/db_xref="G1:2634845"
/db_xref="SPTREMBL:032015"
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/db_xref="G1:2634846"
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                                                                                                                                                                        function-"unknown"
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110996. .111232
/gene="YqzF"
110996. .111232
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ′gene="yqiQ"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /gene="yq10
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gene

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LDYIIPRSKEMGMVITACANVTPDGKAPPGQPAIHDDSNIPGLKKLADAIOAGGAKAV
VOHHGGIECPSELVPQQDVGFSDVPDGKQIPARALTEESPRIVKARGEGARRAIE
AGFDGVELIGANG YLLIQGFVSPKTNORTDRAGGSDERKLAFPLAIVDEVKRASEHAK
GAFLVGYRLSPEEPFTGLTMTETYTLVDALGDRELDYLHISIAMDVNSKARRGADPTR
RTMDLIMBRYCONKVPLIAVGSTHSADDALAYTENGIPEVAMGREILVDPNWTVKVKEG
REKQIETVIKGTDKEKYHLPPEPLWQAIVNTQGWVPYKD"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /db_xref="gMISS-PROT:P06534"
/translation="MEKIKVCVADDNRELVSLLSEYIEGQEDMEVIGVAYNGQECLSL
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SYFILKPFDMENLVGHIRQVSGNASSVTHRAPSSQSSIIRSSQPEPKKKLDASITSI
IHEIGVPAHIKGYLYLERAISWYYNDIELLGSITKVLYPDIAKKFWITASRVERAIRH
AIEVAWSRGNIDSISSLFGYTVSMTKAKPTNSEFIAMVADKLRLEHKAS"
complement(123101. .124397)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               MNDVAPFIQKAGKTGESLDLLIKRDKQKIKTKLIPEKDGGGKYRIGLIRDSAAGIG
TWTFYEPKTKKYGALGHVISDMDTKKPIVVENGEIVKSTVTSIEKGTGGNPGEKLARF
SSERKTIGDINKNSPFGIFGTLHQPLQNNISDOALPVARSTEVKKGPAEILTVIDDDK
VEKFDIEIVSTTPQKFPATKGWVLKTTDPRLLKETGGIVQGMSGSPIIQNGKVIGAVT
HVFVNDPTSGYGVHTEWALSEAGIDIYGKERAS"
complement(124553. .126302)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /translation="MPDNIRKAVGLILLVSLLSVGLCKPLKEYLLIPTOMRVFETQTQ
AIETSLSVNAOTSESSEAFTVKKDPHEIKVTGKKSGESELVYDLAGFPIKKTKVHYLP
DLKVIPGGOSIGVKLHSVGVLVGFHQINTSEGKKSPGETAGIEAGDIIIEMNGQKIEK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /function-"central role in the initiation of sporulation (negative regulation of abrB, kinA, kinC, spo0A; positive regulation of spoITA, spoIIE, spoIIG) (stage 0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /note="alternate gene name: spo0C, spo0G, spoIIL, sof-1"
                                                                                                                             /note="similar to NADH-dependent flavin oxidoreductase"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /function="intercompartmental signalling of pro-sigma-K processing/activation in the mother-cell; essential for spore cortex and coat formation (stage IV sporulation)" /codon_start=1
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /product="two-component response regulator"
/protein_id="CAB14353.1"
/db_xreff="G1:2634856"
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/db_xref="SWISS-PROT:P17894"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /gene="spo0A"
complement(122041. .122844)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /gene="yqiG"
complement(122041. .122844)
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complement(123120. .124397)
/gene="spoivB"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /protein_id="CAB14354.1"
/db_xref="G1:2634857"
                                         120407. .121525
/gene="yqiG"
/function="unknown"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       terminator
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                gene
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /protein_id="CAB14351.1"
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                                                                                                                                            terminator
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COMPLEMENT (130685. 130849)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /note="similar to exodeoxyribonuclease VII (small
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /gene="fold"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1TKKGKGYKPAETDT1GTWHGTGPYKINTGDFYKPKAAAPSWSGLVSGTVQRMAREDG
RIVA1TPAMPVGSKLEGFAKEFPDRWFDVGIAEQHAATWAAMAMQGMKPFLA1YSTF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LQRAY DQVVHDICRQNANV FIGIDRAGLVGADGËTHQGVFDIAFMRHIPNMVLAMPKD
BROGOHMVHTALSY DEGPIAMRE PRGNGJGVKADDOLKTI DIGTWEVLYERGNDAVILT
FGTTI EMA I ERAA EELQKEGLSVRVNARFI KR I DEKNMKSI ILK BGLPILLI EBAVLEG
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QISNPEKIYESLQNAYNALRSEQGGLDWYGMASAQLEDISDINEPLKKMSESVSNSYY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AATAERVKDSLKYMLVSGMFFEELGFTYLGPVDGHSYHELIENLQYAKKTKGPVLLHV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /function="negative regulation of arginine biosynthesis and positive regulation of arginine catabolism (roc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /note="similar to geranyltranstransferase"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /note="similar to hypothetical proteins"
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similar to hemolysin-like"
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GEVATEKAPAKQDTKEKSGTETEKGKEDGTKGTKDSSADKETSAEASEKGTVYTETAD
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LIKTQGYEDALVNAEGDKINITVKSDKHSKSKATAIIDLVAKEIKTMKDVAVTFEPSK
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COMPLEMENT (13824. .139541)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 EVLANGKELGTELLETFCVILQLEONAFOGSTVSKVAYSIVYMVLIILALNSFHVAI
NAFREALQFWATSFILALIALLASSGGAVSAAFPHPULLELMNSGELLONIVMP
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(stage III sporulation)"
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(stage III sporulation)"
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(stage III sporulation)"
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VGPSPDAISKMGTKDVARETMKQAGVPIVPGSQGIIENVEEAVSLANEIGYPVIIKAT
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /product-"acetyl-CoA carboxylase subunit (biotin carboxylase subunit)"
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complement (133902. .134348)

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complement (133902. .133924)

/gene="yqhY"

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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /EC_number="6.4.1.2"
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                                                                                                                                                                                                       terminator
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complement(144304..144840)
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1466063. ..146458
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complement(139968. .140174)
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complement(140197. .140712)
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COMPLEMENT (157946. .158518)
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Fslisgicovcftispmikresgelkrhenyisksamobesdyargonrhendill
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NELRVOTTETENBAVEGENOMEWYQGPOERSKARDLIHFSHWPQCEKWFENNHHY
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FIWLLNHSARLITGVFGLKPASEHELAYTEEELRVLLAESYKSGEIRKSELKYMNNIF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TFDKRMAKEIMVPRNEMVSLSLDEDSISNLØETVKQTKYTRYPVVREDKDNVIGVINM
KEVLESMLTRDFSIKHQIEPPVQPVIHVIETIPIYKLLLKWKERFHMAILIDEYGG
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COMPLEMENT (join (166922. .166950,166983. .167819))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         IHKFSEASSQDISIOEFYEMSRILMONIDEIIEVFTEEYHQYTMIQLAAQKEMINELS
APIMPITDGIGILPLVGEIDTHRARTILESVLEQCSALKLSYLFLDISGVPIVDTMVA
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                                                                                                                                                                                                                                    .165459)
                                                                                                                                                                                                                                                                                        complement(164506. .165459)
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/transl_table=11
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complement(161690. .161986)
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                                                                                                                                                                                              complement(160938. .161285)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        complement(161269. .161700)
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complement (172554...172582)
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VENNGDLGSSIGTLLEPTDLLLAVDIAVLIMHIROKAFGSDIDFSTRNRRAAFERFLY
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SLTEIENYYTANAKDANKRLFGAAKGRNVILVSLESTQSFVINEKLNGEEITPFLNDF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   IKOSYNENNYYHOTGOGKTSDSEFNYDNSLYPLGRGAVFFTNACNQYMAAPEILKNSG
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DQVVYTDGACYDKETGKPLEETKQCEAFADKAKQELSLSDEIIYGDLLRFYDQKRLDN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TIAKTIDSKLDELQKPKHIIKYIGMGAPGPVDMAAGVVYETVNLGWKNYALKNHLETE
TGIPAVIENDANIAALGEMWKGAGDGAKDVILVTLGTGVGGGIIANGEILHGINGAGG
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COMPLEMEN (175598. 175813)
                                                                           SAEKADGAEGWINNSTILYTASNPTKTELFPYRIFTGKAKKLYQTDGQIVDVQINARE
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                                                                                                                                                                                                            ILLKSHETKQLIIDQKEME"
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169909. .169930
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COMPLEMENT (117517. 1177709)
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CDS

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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /gene="sodA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /gene="yqgc"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /gene="yqgC'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SFYISRFE
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                                                                                                                                                                                                                                                                                                                       IEKNAVTALIGPSGCGKSTFLRNINRMNDLIPSARAEGEILYEGLNILGĞNINVVSLR
REIGWYCKPRPRETYANTHALKYAGERKAYLDEN VEBSELTKAALMDEVKDRLH
SSALSLSGGOQQALCIARTLAMKPAYLLLDEPASALDPISNAKIEELITGLKREYSII
IVTHNMQQALRVSDRTAFFLNGELVEYGQTEQIFTSPKKQKTEDYINGKFG
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LINFTEMNPFSETSPLNIFFPAETLAVHIWNVNTQGMIPDAEAIANGGSPVLVISVLVF
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AITIFIGVKGLÖSFLVNGVSFIEFLISLNMRFDSDFKYGVLPFIFGSFAVTILSALI
AABLGIAGFIFWTEIPROKGKVLQPVIELLVGIPSVVYGFIGLTVLVPFIAQFRSG
TGHSLLAGTIVLSVHILPTIFGISADAMASLEKSLREGSYALGATRWQTIRKUVPPAA
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EEKEGIDAKALVDHQVAVVGMAAAVNPDAGVKDISKDELKKIFTGKIKNWKELGGKDQ
KITLVNRPDSSGTRATFVKYALDGAEPAEGITEDSSNTVKKIIADTPGAIGYLAFSYL
TDDKVTALSIDGVKPEAKNVATGEVPIWAYQHSYTKGEATGLAKEFLDYLKSEDIQKS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /translation="MKKNKLVLMLLMAAFMMIAAACGNAGESKKSNSDSAKGEEKASG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        similar to phosphate ABC transporter (binding protein)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /gene="pbpA"
/function="involved in the synthesis of peptidoglycan
to phosphate ABC transporter (ATP-binding
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /function="unknown"
/note="alternate gene name: yzmD
similar to phosphate ABC transporter (permease)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /note="alternate gene name: yzmC
similar to phosphate ABC transporter (permease)"
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complement(184731. .185633)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /protein_id="CAB14428.1"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /gene="yqgH"
complement(183733. .184662)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         complement(182849. .183733)
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                                                                                                                   /transl_table=11
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /gene="yqgH"
/function="unknown"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /function="unknown"
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/transl_table=11
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     yqgG"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /gene="yqgI
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/translation="Miricipid TyraqotrypylnrsfnlsislnDmtdydltkl.
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QLDIDSNIHYDHYRVNNWLEAVQWMNNNKHHLIRVNN"
complement(195406. .195881)
/gene="Yqfv"
complement(195406. .195424)
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/db_xref="GI:2634944"
/db_xref="SWISS-PROT:PROTECTION TO THE TRANSPACE TO THE TRAN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /translation="MNVQEALNLLKGNGYKYTNKREDMLQLFADSDRYLTAKNVLSAL
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EIESCPMDKLCDDLGSGVYGSHKFETYGTCPDCTAENQENTTA"
complement(195937. .196900)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /note="similar to transcriptional regulator (Fur family)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /note="similar to hypothetical proteins from B. subtills"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /note="similar to endonuclease IV"
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/db_xref="SWISS-PROT:P54480"
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complement(195937. .195962)
/gene="yqfU"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      .195881)
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/db_xref="GI:2634945"
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complement(195444.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /function="unknown"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /function="unknown"
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/transl_table=11
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/transl_table=11
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                                   194820. .195401
/gene="yqfW"
194820. .195401
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /codon_start=1
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193139. .194272
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /protein_id="Cab14438.1"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     complement(join(194267. .194288,194298. .194687))
/gene="yqfX"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               IVRKVPEETMVEELKKEIDILAEEHYAKLEAEKAKLKEETQKA"
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complement(191922. .191946)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /gene="yqgA"
complement(192012. .192440)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           complement(191922. .192440)
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                                                                                                           'function-"unknown"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             function-"unknown"
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                          .191586
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         .194272
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /gene="yqfY"
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192717. .19
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193139. .194
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    193139
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INKLIRVORQLLQDIGREPTPEEIAEDMDLYPEKVREILKIAQEPVSLETPIGEEDDS
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complement(205544. .207355)
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COMPLEMENT (_03401. . . 203901)
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/function="initiation of Okazaki fragments (DNA
                                                                                                                                                                                                                                                                                    /note="similar to hypothetical proteins"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /note="alternate gene name: rpoD, crsA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /note="alternate gene name: dnaE"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          LVPADKLDDMAEWVSKIK" complement(204202. .205345)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 complement(203539. .203901)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           complement(204230. .205345)
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                                                                                                                                                                                                      complement(202632. .203282)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              complement(203401.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /codon_start=1
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       synthesis)"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /translation-**MKETKFELYELKFPIIDAVHRLGFYEPTDIQKRLIPAVLKKESV
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KIEHILIPSKRIBÖKDKLLFDIMSHLARPIGIYGTVFANTKNTADHIAQYLTGKGKXIGLLH
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PNEADEIAHRLVKFRKVKFGYKKNSYEMEKIKKKORRNOSKKRK*
199685. .200428
199685. .200428
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   KHVTDAFEEBGILTLOGSNRLDILKQVDKGYVIFTAHGVSPEVRRIREEKGIVAIDAN
CPDVTKTHALILEMKEKGYHVIYICKGHPEPEGAVGVAPEIVHLVETEEDVKNLDIQ
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TKEVIRFLEQPDHEDPSTWTTEHNIPLKKILLPKVKAKN"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /protein_id="CAB14447.1"
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GAKQIVLHPGAHVGAGAEAGIKKIIEGLNEVIDPNQNVQIALETMAGKGSECGRSFEE
                                                                                                                                                                                                                                                                                                                                    /note="similar to ATP-dependent RNA helicase"
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gene

CDS

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SQYLAHKRIKVANVPIVPEVDPPEELFNVDPKKCIGLKISPDKLNHIRKERIKSLIGLN
                                                                                                                             IKDVLKEISTLSGSLEQEVYVKQLASFFSLSOESLTEGLSVFSKQNKPADNSGETKTR
RAHLTTKARQKRLRPAYENAERLLLAHMLRDRSVIKKVIDRVGFQFNIDEHRALAAYL
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MELEDVGRIEFVVDRDAVLVSVLSRKDLIRASTGOQELTSVPVHIIMTRMPNITVCRRE
DYVMDIAKHLIEKOLDALPVIKDTDKGFEVIGRVTKTNMTKILVSLSENEIL"
COMPLEMEN (209746. 211785)
                                                                  VSSDVKESIATMGTSLTDDHVKILRRNVEEIILCYDSDKACYEATLKASELLQKKGCK
VRVAMIPDGLDPDDXIKKFGGEKFKNDIIDASVTVMAFKMQYFRKGKNLSDEGDRLAY
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KWIYOSCLETMAAENNWSIPVDEDLLDEVNHLUSTPTALKGSFESEELSIPESVLVT
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QKLNIDANVKKLENIVFHEELGSLADKVRRYISIAEKLAVRLQADEDTLKHVKRAAEI
GYALDSWDF1TKFLVKRGFSEAQMEKAGLLIRREDGSGYFDRFRNRVMFPIHDHGAV
VAFSGRALGSQQPKYMNSPETPLFHKSKLLYNFYKARLHIRKQERAVLFEGFADVYTA
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VKLFNTPRRLAVFVKDVAEKQDDIKEEAKGPAKKIALDADGNWTKAAIGFSKGQGANV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DKAIYANINRIKEELEYFEKIVDRIGCQVVDVSNKAVEETANIIHHLKTKNI"
complement(208975. .209613)
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                                                                                                                                                                                                                                                                                                                                                                                                                                        /note="alternate gene name: yqfm
similar to hypothetical proteins"
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                                                                                                                                                                                                                                                                                                                                       complement(207389. .207979)
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complement(208975. .209613)
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gene

gene

CDS

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Escherichia coli K12.
Escherichia coli K12
Bacteria; Proteobacteria; gamma subdivision; Enterobacteriaceae;
Escherichia.
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-CGCAGTTACCGACGGGCGCGGGGCGCGCGGAAGACTTATCCCGGTACAGGGAGTCTACGCAGCG
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0 131560 131570 131580 131590 131600 131610 131620
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VERSION
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51645 c 43161 q 65474 t
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GCTATAATGCGGCA-ATTGATA
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SUBMITTED (13-OCT-1998) Laboratory of Genetics, University of Wisconsin, 445 Henry Mall, Madison, WI 53706, USA

Wisconsin, 445 Henry Mall, Madison, WI 53706, USA

Wisconsin, 445 Henry Mall, Madison, WI 53706, USA

This sequence was determined by the E. coll Genome Project at the University of Wisconsin-Madison (Frederick R. Blattner, director). Supported by NIH grants HG00301 and HG01428 (from the Human Genome Project and NUHGR), The entire sequence was independently determined from E. coli K12 strain MG1655, Predicted open reading frames were determined using GeneMark Software, Kindly supplied by Mark Borodovsky, Georgia Institute of Technology, Allanta, GA, 30332 [e-mall: mark@amber.gatech.edu]. Open reading frames that have been correlated with genetic loci are being annotated with GS Stock Center (GGSC) database at Xale University, Kindly supplied by Mary Berlyn. A public version of the database is accessible (Rttp://cgsc.blology.yale.edu). Annotation of the genome sequence more useful by correlating it with other data. Comments to the authors are appreciated. Updated information will be available at the E. coli Genome Project's World Wide Web site.

(http://www.genetics.wisc.edu). *** The E. coli K12 sequence and tits annotations are periodically updated; this is version M54. No sequence changes. Annotation updates: updated gene lidentifications and products; all new functional assignments courtesy of Monica Riley: added promoters, protein binding sites, and repeated sequence described in reference 1. The unique numeric identifiers beginning with a lowercase 'b' assignment cash gene (protein or Names). This should allow them to be searched for in Entere as gene names.
                                                  Perna, N.T., Burland, V.,
1 (bases 1 to 10959)
Blattner,F.R., Plunkett,G. III, Bloch,C.A., Perna,N.T., Burland,V.
Blattner,Collado-Vides,J., Glasner,J.D., Rode,C.K., Mayhew,G.F.,
Gregor,J., Davis,N.W., Kirkpatrick,H.A., Goeden,M.A., Rose,D.J.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Direct Submission
Submitted (02-SEP-1997) Guy Plunkett III, Laboratory of Genetics,
University of Wisconsin, 445 Henry Mall, Madison, WI 53706, USA.
Emall: ecol1@genetics.wisc.edu Phone: 608-262-2534 Fax:
                                                                                                                                                                                                                                                                                                           Blatter, F.R. Direct Submission
Direct Submission
Submitted (16-JAN-1997) Guy Plunkett III, Laboratory of Genetics, University of Wisconsin, 445 Henry Mall, Madison, WI 53706, USA. Email: ecoli@genetics.wisc.edu Phone: 608-262-2534 Fax:

    40
    note="factor Sigma70; predicted +1 start at 1184959"

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Science 277 (5331), 1453-1474 (1997)
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/organism="Escherichia coli K12"
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/note="b1127"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               4 (bases 1 to 10959)
Plunkett,G. III.
Direct Submission
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  to 10959)
                                                                                                                                                                                                                                                                                     (bases 1 to 10959)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /gene="pepT"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  .1381
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (bases 1
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JOURNAL
MEDLINE
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/db_xref="GI:H787773"
/db_xref="GI:H78773"
/db_xref="
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ALDALASNIALTAENRCDALEDPSFLAMLAALVNSGYWFFEG"
complement(2583. .2613)
/note="factor sigma70; predicted +1 start at 1187488"
complement(2627. .4087)
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MGLINVTLSEKGTLMATLPANVPGDIPAIGFISHVDTSPDCSGKNVNPQIVENYRGGD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          IALGIGDEVLSPVMFPVLHQLLGQTLITTDGKTLLGADDKAGIAEIMTALAVLQOKKI
PHGDIRVAFTPDEEVGKGAKHFDVDAFDARMAYTVDGGGVGELEFENFNAASVNIKIV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GNNVHPGTAKGVMVNALSLAARIHAEVPADESPEMTEGYEGYEGYHLASMKGTVERADMH
YIIRDFDRKQFEARKRKMMEIAKKVGKGLHPDCYIELVIEDSYYNMREKVVEHPHILD
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VNVYPATSRMPKLTIVVDYIPVBELKSSYMWKSWFIYVLSANKLLVIPLLWVAMWSL
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SELTVELAVLOSTLASIRSKWSVSDAEPVALEQISRISOOIGY THRASMRGGTLLS
RELHPVAPLLDNLTSALIKY VORKGYNISLDISPEISFVGEQNDFVEVWGNVLDNACK
YCLEPVEISARQTDEHLY IVVEDDGPG IPLSKREVI FEDRGORVDTLRPGGGYGLAVAR
EITEQYEGKIVAGESMLGGARMEV IFGRQHSAPKDE"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                IAQQAMRDCDIEPELKPIRGTDGAQLSFMGLPCPNLFTGGYNYHGKHEFVTLEGMEK
AVQVIVRIAELTAQRK"
                                                    PEPT_ECOLISW: P29745; 93 pct identical to 407 residues of 409 aa PEPT_SALTY SW: P26311"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /function="regulator; Global regulatory functions"
/note="f223; 100 pct identical to PHOP_ECOLI SW: P23836"
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/note="f486; 99 pct identical to PHOQ_ECOLI SW: P23837"
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/note="f376; 100 pct identical to fragment YCFD_ECOLI
SW:P27431 but has 3 additional N-terminal aa and.93
additional C-terminal aa"
/note="0408; 100 pct identical to 42 aa fragment
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                                                                                                                                                                                                                                                                          /product="putative peptidase T"
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/gene="pho0"
/EC_number="2.7.3.-"
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/gene="ycfD"
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/transl_table=11
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/note="b1128"
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CDS

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Aglenkaldsadaekvikflreemgvyktirpfpehggigirpgsebgtkrlynalieval
Aglenkaldsadaekvikkflredafkrbwgvglarefggelinggpwlkyknpufgkely
IkDviadaflogillrpaeydviacmningdyisdalaaqyggigiapganigdecal
Ferthgtarkyagodkynggiillsabwalrhwgwteaadlivkgmegainaktyyd
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ccrwvsaeeiloasnlrsplvaesircyosgoryplemigdfnwpftkgvi"
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TDEAGRKTIKEFIPVQGVYAAGRLDRDSEGLLVLTNNGALQARLTQPGKRTGKIYVVQ
VEGIPTQDALEALRNGVTLNDGPTLPAGAELVDEPAWLWPRNPPIRERKSIPTSWLKI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /function="orf; Unknown"
/note="f207; This 207 aa ORF is 66 pct identical (1 gap)
to175 residues of an approx. 248 aa protein Y694_HAEIN SW:
p44827"
                                                     /function="putative enzyme; Not classified" /note="f153; This 153 aa ORF is 45 pct identical (3 gaps) to 57 residues of an approx. 160 aa protein MUTT_STRAM SW: P32091"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /EC_number-"1.1.1.42"
/function="enzyme; Energy metabolism, carbon: TCA cycle"
/note="0416; 100 pct identical to IDH_ECOLI SW: P08200"
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/protein_id="AAC74220.1"
/db_xref="GI:1787381"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GCGGGCTACCGCCACCCTACACCTTGCCCAGGGCGTAAAGTATCAACCCGTTGACCAGGGTCAAAATGAC 2780 2790 2790 2800
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GCT-ATAA-TGCGGCAATTGA-
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9283. 9311
/note="factor sigma70; predicted +1 start at 1194230"
9434. .10684
/gene="icdA"
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Mismatches = 267
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                                                                                                                                                                                                                                     /product="putative phosphohydrolase"
/protein_id="AAC74218.1"
/db_xref="G1:1787379"
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Matches = 360
Conservative Substitutions
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                           complement(8609. .9232)
/gene="ymfC"
                                                                                                                                                                                                                                                                                                                                                                                            complement(8609. .9232)
/gene="ymfc"
/note="bl135"
/gene="b1134"
complement(8138. .8599)
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/transl_table=11
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9434. .10684
/gene="icdA"
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Residue Identity
Gaps
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complement(6443. .6471)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       KVAEIPELHAVSEFIHFACTSEDINNLSHALMLKTARDEVILPYWRQLIDGIKDLAVQ
YRDIPLLSRPHGQPATPSTIGKEMANVAYRWERQYRQLNQVEILGKINGAVGNYNAHI
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RDLTDSTVLRNLGVGIGYALLAYQSTLKGVSKLEVNRDHLLDELDHNWEVLAEPIQTV
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KFRERLGRYLDAQDEKIITYVGDETECERGGLAWTHTGORKGLGIGGYREGTEBEWYV
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TVKALDDDRIEVIFDEPVAAVTPGQSAVFYNGEVCLGGGIIEQRLPLPV"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MRRYGIEKPYEKLKELTRGKRVDAEGMKQFIDGLALPEEEKARLKAMTPANYIGRAIT
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/function="orf; Unknown"
/note="f213; 99 pct identical to YCFC_ECOLI SW: P25746"
/codon_start=1
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/function="enzyme; Purine ribonucleotide biosynthesis"
/note="f456; 99 pct identical to PUR8_ECOLI SW: P25739"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /note="f383; 100 pct identical to fragment YCFB_ECOLI
SW:P25745 but has 152 additional N-terminal residues"
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complement(8138. .8599)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /gene="ycfc"
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complement(6978. .8129)
                                                                                                                                                            /gene="phop"
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                                                                                                                                                                                                                                                                                                   complement(4927. .6297)
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                                                                              GAGTCTACGCAGGGGACGTCTGGATC-GCGACAGGGGGCTGCTGGTCCTTACCAATGACGGCGTGCTC
                                                                                                                                                                                                                                                                                                                                                                                    CGGACGCACGCTGGCAAAGCTGC-GCA--AC-GGC---GTAACGCTGAACG---ACGGTCCCACCTG
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                                                                                                                                                                                                                                                                                             190 300 310 310 320 320 CAGGGAAAAATTTACTATGTGAGGTTGAAGGGGA---GC
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VERSION
KEYWORDS
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Plunkert, G. 111.

Submitted (13-OCT-1998) Laboratory of Genetics, University of Wisconsin, 445 Henry Mall, Madison, WI 53706, USA

This sequence was determined by the E. coli Genome Project at the University of Wisconsin-Madison (Frederick R. Blattner, director). Supported by Misconsin-Madison (Frederick R. Blattner, director). Froject and NCHGR). The entire sequence was independently determined from E. coli K12 strain WG1655. Preddicted open reading frames were determined using GeneMark software, kindly supplied by Mark Borodovsky, Georgia Institute of Technology, Atlanta, GA, 30332 [e-mail: mark@amber.gatech.edu]. Open reading frames that have been correlated with genetic loci are being annotated with CG Site Nos. unique ID nos. for the genes in the E. coli Genetic Stock Center (CGSC) database at Yale University, kindly supplied by Mary Berlyn. A public version of the database is accessible (http://www.genetics.blology.yale.edu). Annotation of the genome sequence more useful by correlating it with other data. Comments to the authors are appreciated Updated information will be available at the E. coli Genome Project's World wide Web site

(http://www.genetics.wisc.edu). *** The E. coli K12 sequence and its annotations are periodically updated; this is version M54. No sequence changes. Annotation updates; updated gene identifications and products; all new functional assignments courtesy of Monica Riley; added promoters, protein binding sites, and repeated sequence changes. Annotation assignments courtesy of Monica Riley; added promoters, protein binding sites, and repeated sequence described in reference I. The unique numeric Identifiers beginning with a lowercase "b' assignment of each gene protein or RNA-encoding) are now designated as gene synonyms instead of annotance of assertine as gene carries of the process 
                                                                                  l (bases 1 to 11961)
Blattner, F.R., Plunkett, G. III, Bloch, C.A., Perna, N.T., Burland, V.,
Riley, M., Collado-Vides, J., Glasner, J.D., Rode, C.K., Mayhew, G.F.,
Gregor, J., Davis, N.W., Kirkpatrick, H.A., Goeden, M.A., Rose, D.J.,
Mau, B. and Shao, Y.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Direct Submission
Submitted (16-Jahr 1997) Guy Plunkett III, Laboratory of Genetics,
University of Wisconsin, 445 Henry Mall, Madison, WI 53706, USA.
Email: ecoli@genetics.wisc.edu Phone: 608-262-2534 Fax:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Submitted (02-SEP-1997) Guy Plunkett III, Laboratory of Genetics, University of Wisconsin, 445 Henry Mall, Madison, WI 53706, USA. Email: ecoli@genetics.wisc.edu Phone: 608-262-2534 Fax:
Bacteria; Proteobactería; gamma subdivision; Enterobacteríaceae;
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Plunkett, G. III.
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                                                Escherichia.
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INTSIAPAQRQAİANSFARALQSSINEDKAH"
6003. .7763
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/note="b2188"
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KOMPALAGRARDNISFTRHMSGNTPNDGIFCLFYGISPSYMOGILGERTPAALITAL
NOGGYQLGLESSDGTFSPLYRGALLSDFSMPSVRTGSDEQTATOWINNIGRYAQEDNR
WFSWVSFNGTNIDDSNQQAFARKYSRAAGNVDDQINRVLNALRDSGKLDNTVVIITAG
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VLFCHYRYLAVEYLLVAVLSNLSSMRVNENLDINPTHYLDINHADIVARIDLTEWETN
PESTRYLTFLKGRYGRKVADFFMDFLGASEGLNAKAQNRGLLQAVDDFTAEAQLDKAE
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IDSEVFTRFHLHLNPIVWQLVINPDENEMARDWQLMFISVPVILLLELVFATWSWQKL
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RSLTRRRFARPLAAFLFIAFIASHVVY IWADANFYRPITMQRANLPLSYPMTARRFL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           RQNVRQQVYSYCNEQLQAGEEIELKSLSKELAGVSEVSFFFFAARGYELEESFPADR
STLRQLTKFAGSGGGLTINFDAMLLGERIFWDPATDTLTIKGTPPNLRDQLQRRTSGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /translation="MYTHRQRYREKVSQMVSWGHWFALFNILLSLVIGSRYLFIADWP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /note="f335; 100 pct identical to YEJK_ECOLI SW: P33920"
/codon.start=1
/transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /note="o586; 100 pct identical to YEJM_ECOLI SW: P33922"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         5756. .5983
/gene="yejl"
/function="orf; Unknown"
/note="075; 100 pct identical to YEJL_ECOLI SW: P33921"
/codon_start=1
                                                                                                        synthesis, modification"
/note="094: 100 pct identical to RL25_ECOLI SW: P02426"
                                                                                                                                                                                                                                                                                                                                                         4514. 4547
/note="REP (repetitive extragenic palindromic) element;
contains 1 REP sequence"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               component; Ribosomal proteins
                                                                                                                                                                                                                                                                                                                                        DKVMNMQAKAEFYSEVLTIVVDGKEIKVKAQDVQRHPYKPKLQHIDFVRA"
                                                                                                                                                                                         /transl_table=11
/product="508 ribosomal subunit protein L25"
/protein.id="858.75246.1"
/db_xref="GI:1788512"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        6003. ,7763
/gene="ye]M"
/function="putative enzyme; Not classified"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /transl_table=11
/product="orf, hypothetical protein"
/protein_id="AAC75248.1"
/db_xref="GI:1788514"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /product="putative sulfatase"
/protein_id="AAC75249.1"
/db_xref="GI:1788515"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /function="orf; Unknown"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 complement(4567. .5574)
                                                                                                                                                                                                                                                                                                                                                                                                                                                complement(4567. 5574)
                                                                                    /function="structural
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        5756. .5983
/gene="yejl"
/note="b2187"
                                                                                                                                                                  /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /note="b2186"
                             4144. .4428
/gene="rply"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /gene="yejK
                                                                                                                                                                                                                                                                                                                                                                  repeat_region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  promoter
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                             CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            HDVAYDGNPLAQQHGPRYEMLNKPOGYVCSTDDPDHPTVLYFLDEPVAWKLHAAGRLD
IDTTGLVLMTDDGQWSHRITSPRHHCEKTYLVTLESPVADDTAEQFAKGVQLHNEKDL
TKPAVLEVITPTQVRLTISEGRYHQVKRMFAAVGNHVVELHRERIGGITLDADLAPGE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  FWGKTTADGTLIEHFGRRCQGWFEDDGHREQCDFRFRFKNCPQCNAENDIAARRCRE
CDTVLVDPDDMLKAALRLKDALVLRCSGMSLQHGHDEKGEWLKITYYDEDGADVSERF
RLQTPAQRTAFEQLFIRPHTRTPGIPLRWITAADILAQQALLRHPDFVVARWKGQYWQ
                                                                                                                                                                                                                                                                                                     MLASGFSFAGMFSFLSAGPFVYIEINHVAPENFGYYFALNIVFLFVWTIFNSRFVRTI
GALNWFRSGLWIQFIMAAWWVISALLGLGFWSLVVGVAAFVGCVSWVSSNAMAVILDE
FPHWAGTASSLAGTFRFGIGAIVGALLSLATFNSAWPMIWSTAFCATSSILFCLYASR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /function="putative enzyme; Not classified"
//function="0586; residues 1-396 are 100 pct identical to 396
residues of YEJLECOLI SW: P33919 (403 and) and residues
493-586 are 100 pct identical to as 2-95 of YEJJ_ECOLI SW:
P36927; residues 404-477 are 100 pct identical to
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ARLARGRVLVLAHVKELVAQNHÄKYQALGLEADIFAAGLKRKESHGKVVFGSVQSVAR
NLDAFQGEFSLLIVDECHRIGDDEESQYQQILTHLTKVNPHLRLLGLTATPFRLGKGW
IXQFHYHGMVRGDEKALFRDCIYELPLRYMIKHGYLTPPERLDMPVVQYDFSRLQAQS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /translation-"MRLDKFIAQQLGVSRAIAGREIRGNRVTVDGEIVRNAAFKLLPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NGLFSEADLNRELKKQQRITPHIISQIMEFAATRKGYMIFAATVEHAKEIVGLLPAED
AALITGDTPGAERDYLIENFKAQRFRYLYNNAYLTTGFDAPHYDLIAILRPTESVSLY
                                                                                                                                                                                      /translation="MTTRQHSSFAIVFILGLLAMLMPLSIDMYLPALPVISAOFGVPA
                                                                                                                                                                                                                   GSTQMTLSTYILGFALGQLIYCPMADSFGRKPVVLGGTLVFAAAAVACALANTIDQLI
VMRFFHGLAAAAASVVINALMRDIYPKEEFSRMMSFVMLVTTIAPLMAPIVGGWVLVW
                                                                                                                                                                                                                                                                           LSWHYIFWILALAAILASAMIFFLIKETLPPERRQPFHIRTTIGNFAALFRHKRVLSY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /translation="MIFTLRPYQQEAVDATLNHFRRHKTPAVIVLPTGAGKSLVIAEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             QOIVGRGLRLAPGKTDCLILDYAGNPHDLYAPEVGTPKGKSDNVPVOVFCPACGFANT
                                                                                    resistance protein; transmembrane
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           "your "cours position to predicted promoter: -170.5" //hound_moiety="CynR predicted site" 2197. 2197
'note="f396; 99 pct identical to BCR_ECOLI SW: P28246"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     2167. 2197
/note="factor Sigma70; predicted +1 start at 2278597"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /note="factor Sigma70; predicted +1 start at 2277837"
complemit(1626. .1650)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   4032. .4060
/note="factor Sigma70; predicted +1 start at 2280460"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /function="enzyme; RNA synthesis, modification, DNA transcription"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /transl_table=11
/product="16S pseudouridylate 516 synthase"
/protein_id="AAC75244.1"
/db_xref="G1:1788510".
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /product="putative ATP-dependent helicase"
/protein_id="AAC75245.1"
/db_xref="GI:1788511"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /note="f231; formerly designated yejD"/codon_start=1
                                                                                                                               /protein_id="AAC75243.1"
/db_xref="G1:1788509"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 complement(1415. .2110)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           complement(1451. .1479)
                                                                                                                                                                                                                                                                                                                                                                                                                   complement(1415. .2110)
                                                                                 /product-"bicyclomycin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         VREKVFDY EGRFRLAHELRG'
                                                       /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /codon_start=1
                               codon_start=
                                                                                                                                                                                                                                                                                                                                                                                                                                                /gene="rsuA"
/note="b2183"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    YRPLTEEEIASVV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /gene="yejH"
/note="b2184"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          4144: .4428
/gene="rplY"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                2259. .4019
/gene="yejH'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /gene="rsuA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /gene="rsuA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /gene="rsuA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            .4019
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            protein_bind
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               110
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                                                                                                                                                                                                                                                                                                                                                                              ERSH"
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518
115
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Residue Identity
Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                            promoter
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /protein_id="AAC75250.1"
/db_xref="GI:1788516"
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/Kranslation="AASTVEKGETVDGVVLEKDIOLVYGTANNTKINPGGEDHIKEFG
/KRANTEINGGYQYIEMNGAAEYSVLNDGYQIVQMGGAANQTTLNNGVLQVYGAANDTT
IKGGRLIVERDGGAFEVALEKGGLLEVKEGGFALFWDGGALVEVMDGATVTTARAMEVFGTNR
IGGPDIKNGIANNMLLENGGSLRVEENDFAYNTTVDSGGLLVWEDYGADTUTLGKHAMQ
KLIVSTNALEVSGPRSKGQFSITKDGYSKNYELDGSGCLIVWEDYGADTUTLGKHAMQ
SLGORDTGRKVQANAYYDLGSSYONGSITYSSKA ISENWYINGRANVANGTWRYNYSK
GNDGILEVWKPQINYAPAMLVGKVVVSEGASFRTHGAVDTSKADVSLENSWTIIADI
TTRKONTLLMLAMSDANYINMDBEVTRSSYTASANENFITTTTNTLGGNGNEYMT
DMANHQSDQLMYTGQATGDFKIFYTDTGASAAGDSLTLYTTGGGBAAFTLGNAGGVV
DIGTYEYTLLDNGNHSWRLARNYTTAGAAGFEQTLIGIDSRFSREESSTIRGLIFGY
RGIPLSEEEETFDWSHGHLQVPLVIHWPGTPAQRINALTDHTDLMTTLMQRLLHYSTP
ASEYSQGQDLFNPQRRHYWVTAADNDTLAITTPKKTLVLNNNGKYRTYNLRGERVKDE
KPQLSLLLQVLTDEKRFIAN"
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GDYNSNGAGAHVESGFRWVDGLMSVRPYLAFTGFTTDGQDYTLSNGMRADVGNTRILR
AEAGTAVSYHMDLQNGTTLEPWLKAAVRQEYADSNQVKVNDDGKFNNDVAGTSGVYQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /function="putative transport; Not classified"
/funct="f836; This 836 as ORF is 99 pct identical to
//foresidues of a 863 as protein YEJO_ECOLI SW: P33924 but
contains -27 additional N-ter"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /function="orf; Unknown"
/note="o40; This 40 aa ORF is 38 pct identical (1 gap)
to31 residues of an approx. 384 aa protein ILEU_HUMAN SW:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /transl_table=11
/product="putative ATP-binding component of a transport
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /product="orf, hypothetical protein"
/protein_id="aAC75251.1"
/db_xref="GI:1788517"
/db_xref="GI:1788517"
/db_xref="GI:1788517"
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/db_xref="GI:17857"
/db_xref="GI:1787"
/db_xref="GI:17740"
/db_xref="GI:1774
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/note="f338; 98 pct identical to YI52_ECOLI SW: P03837"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GIRSSFTPTLSGHLSVSYGNGAGVESPWNTQAGVVWTF"
10358. .10386
/note="factor Sigma70; predicted +1 start at 2286786"
10532. .10654
/gene="ball"
10532. .10654
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   start at 2286955"
                                                                                                                                                                                                                                   Site No. 17629
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            complement(10569. .10597)
/note="factor Sigma70; predicted +1
complement(10692. .11708)
                                                                                                                                                                                                                /note-"anticodon: GGG; CG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /transl_table=11
/product="IS5 transposase"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      complement(10692. .11708)
                                                                                                                                                                                                                                                                                                                                                                                            /gene="proL"
/note="b2189"
complement(8017, .10527)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               complement(8017. .10527)
                                                                                                                                                                                                                                                                   /product="tRNA-Pro"
/function="RNA; tRNA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /codon_start=1
/transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /note="b2190"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /gene="b2191
                                                                                                                                                                                /gene="proL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /gene="trs5_
/note="b2192
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /note="IS5"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                system"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        repeat_region
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                promoter
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gene

gene

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/db_xref="G1:1788518"
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PWQNWYEVIPEPPYRAGNGRRPYPLETMLRHGNGHWYNLSDCAMEDALYETASMRLF
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GNLLHGEEQFVSADAGYQGAPQREELAEVDVUWLIAERPGKYRTLKGHPRKRYAINI
EYMKASIRARVEHPFRIIKRQFGFVKARYKGLLKNDNQLAMLFTLANLFRADQMIRQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    X 10 20
GCTAT-AATGCGGCAATTGATA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           30 40 80
ACGCCT-----GAAAA-TACC-ATGACGAAAACTTCTTTTAGAAAACACCGGGTTGAGCGATTCAGCTCA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CGACAAGCCACCAGAAGAACGCCAGAACCCCAACGCGACGGGT--CAT-ACTGTTCAATAAA--CCCTAC

GGANIGGTTTGAAGATG-ACGACGGTCATCGGAACAATGGTTTCGTTTTAAAAATTGCCCG
3500 3500 3500 3560
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CTACGCAGCGGGACGTCTGGATCG-----CGACAGCGAGGGGCTGCTGGTCCTTAC-CAATGACGGCGTGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            420 430 440 440 450 460 470 480 TGCCGGCTGGTA-TTGAACCCGAGTGGCTGTGGCCGCGCAACCCGGCGAT-TCGT-GAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     -GCCCGC--ATACGCGCACACACGGCAT---CCCGCTGCATCACCG----CCGCCGATATCCTCGCC 3870 3880 3890
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TCCAGGCCAGGCTTACTCA-GCCGGGCAA-ACGTACCG-GAAAAATTTACTÄTGTGCAGGTTGAAGGCGAGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /note="factor Sigma70; predicted +1 start at 2288242" 11961. .>11961 /note="factor Sigma70; predicted +1 start at 2288389" 13186 c 2857 g 2968 t
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CGGACG----ACGCGT---CGCTGGCAA-AGCTGCGCAACGGCGTAACG--TGAACGACGGTCCCACCC
                                                                                                                                                                                                                                                                                                                                                                                                                   302 Significance - -0.65
377 Mismatches - 243
ilons - 0
                                                                                                                                                                                                                                                                                                                                                                          AE000308 Length: 11961 September 24, 2001 09:20 Type: N Check: 6916
                                                                                                                                                                                                      at
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              540
                                                                                                                                                                          complement(11817. .11843)
/note="factor Sigma70; predicted +1 start of complement(11856. .11886)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              530
                                                                                                                                                                                                                                                                                                                                                                                                                   Optimized Score = 302
Matches = 377
Conservative Substitutions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  330
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   260
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            520
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Headed by
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Oshima,T., Alba,H., Baba,T., Fujita,K., Hayashi,K., Honjo,A., Ishama,T., Alba,H., Baba,T., Fujita,K., Kanai,K., Kashimoto,K., Irada,T., Itoh,T., Kajihara,M., Kanai,K., Kashimoto,K., Kimura,S., Kitagawa,M., Makino,K., Masuda,S., Miki,T., Mizobuchi,K., Mori,H., Motomura,K., Nakamura,Y., Nashimoto,H., Nishlo,Y., Saito,N., Sampei,G., Seki,Y., Tagami,H., Takemoto,K., Wada,C., Yamamoto,Y., Yano,M. and Horiuchi,T. A 718-kb DNA sequence of the Escherichia coli K-12 genome corresponding to the 12.7-28.0 min region on the linkage map DNA Res. 3 (3), 137-155 (1996)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Submitted (29-JUL-1996) to the DDBJ/EMBL/GenBank databases. Hirotada Mori, NARA Institute of Science and Technology, Res. & Edu. Center for Genetic Info.; 8916-5 Takayama, Ikoma, Nara 630-01, Japan (E-mail:hmori@gtc.aist-nara.ac.jp, Tel:81-7437-2-5660, Fax:81-7437-2-5669)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2 (sites)
Alba, H., Baba, T., Fujita, K., Hayashi, K., Honjo, A., Horiuchi, T.,
Ikemoto, K., Inada, T., Isono, S., Itoh, T., Kanai, K.,
Kasai, H., Kashimoto, K., Kim, S., Kinura, S., Kitagawa, M.,
Kitakawa, M., Makino, K., Masuda, S., Miki, T., Mizobuchi, K., Mori, H.,
Saito, N., Nakamura, Y., Nashimoto, H., Nishio, Y., Oshima, T.,
Saito, N., Sampei, G., Seki, Y., Tagami, H., Takemoto, K., Wada, C.,
Yamamoto, Y. and Yano, M.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        The systematic sequencing of the Escherichia coli genome in Japan Unpublished (1996)
3 (bases 1 to 15007)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Bacteria; Proteobacteria; gamma subdivision; Enterobacteriaceae;
Escherichia.
                                                                                                                                                                                                        | 550 | 560 | 570 | 580 | 570 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 | 610 
                                        CGTAAATCC--ATTCCTACCAGCTGG--CTTAAAATCACCCTTTATG-AAGGCCGCAACCGACAGGT----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GATTGATGTATAAGGCGATTGAGTATAGAATCTCGCCCGCTTTTGCATACGCAAAGCAGATCACTTACCTGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Escherichia coli genomic DNA. (25.6 - 25.9 min).
D90748 AB001310
D90748 1. G1:165153
Complete and shotgun sequencing; potB; potA; pepT; phoQ; phoP; purB; ycfE; ycfE; icdA; icdA; icdE; lit.
Escherichia coli(strain:K12) DNA, clone:Kohara clone #239.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    x 4100
                                                                                                                                                                                                                                                                                                                                                                                                                                  The Japan E.coli genome DNA sequencing group Members: (1995.4 - 1996.3)
Alba, H., Baba,T., Fulita,K., Hayashi,K., Honjo,A., Horiuchi,T., Ikemoto,K., Inada,T., Isono,K., Isono,S.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               4090
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            to: 15007
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             The Japan E.coli genome DNA sequencing project
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                6. US-09-252-691C-1394 (1-669)
d90748 TOIG of: d90748 check: 3982 from: 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     to: 15007
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           4070
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            check: 3982 from: 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Collaboration Information:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               4060
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               4050
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Project
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Mori, H.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TOIG of: d90748
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    4040
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              JOURNAL
MEDLINE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TITLE
JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TITLE
JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        REFERENCE
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       REFERENCE
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SOURCE
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RLLDPLYFEYLLHSINMALIATLACUVLGYPFAWFLAKLPHKYRPLLLELLIYPFWTN
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                                                                                                                                                                                                                               Address: National Institute of Basic Biology, Okazaki, 444, Japan E-mail: Kishoridalab.ac.jp
Information operator:
Name: Hirotada Mori
Address: NARA Institute of Science and Technology,
Ikoma, 630-01, Japan
E-mail: hmorl@qtc.aist-nara.ac.jp
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NGKMVMVSEFFNEDDPDFDHSLDQKMAINWVESWEVVLADEEHK"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           coli"
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Location/Qualifiers
1. 15007
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /organism="Escherichia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        complement(692. .1828)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                complement(692. .1828)
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                                                                                                                                                                                                      Name: Takashi Horiuchi
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /strain="Kl2"
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CDS

CDS

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complement(8901. 10007)
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EPVAAVTPGQSAVFYNGEVCLGGGIIEQRLPLPV"
complement(10061. .10522)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NKPYDVLPOFTDEAGRKTLKEFIPVOGYYAAGRLDROSEGLLVLTNNGALQARLTOPG
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                similar to SwissProt Accession Number P25745"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SwissProt Accession Number P08200"
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similar to PIR Accession Number S19211"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /product="Hypothetical protein HI0694"
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similar to SwissProt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /note="icdA; icdE"
11357, .12607
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /codon_start=1
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                                                                                                                                                                                                                                                                MVDELK"
                                                                                                                                                                                                                                                                                               gene
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LORELGGNYYSDPDVPPRAHPADVLPQEMDKILREMMIELINQPEHFKOWFGEFISGSR
HELDIAPPEPPYQPBIYDALKQGEVIJRLGGLRVLRIGDDVYANGEKIDSPHRPALD
ALASNIALTAENFGALEDPSFLAMLAALVNSGYWFFEG"
COMPLEMENT (4550. .6010)
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                                                                                                                                                                                                                                                                                                                                                      "phoo"
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Alba, H., Baba, T., Fujita, K., Hayashi, K., Honjo, A., Horiuchi, T., Ikemoto, K., Inada, T., Isono, K., Isono, S., Itoh, T., Kanai, K., Kasai, H., Kashimoto, K., Kim, S., Kimura, S., Kitagawa, M., Kitakawa, M., Makino, K., Masuda, S., Miki, T., Mizobuchi, K., Mori, H., Motomura, K., Nakamura, Y., Nashimoto, H., Nishio, Y., Oshima, T., Saito, N., Sampel, G., Seki, Y., Tagami, H., Takemoto, K., Wada, C., Yamamoto, Y. and Yano, M.

The systematic sequencing of the Escherichia coli genome in Japan Unpublished (1996)

(bases 1 to 20284)
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Sobhima, T., Alba, H., Baba, T., Fujita, K., Hayashi, K., Honjo, A.,
Ikemoto, K., Inada, T., Itoh, T., Kajihara, M., Kanai, K., Kashimoto, R.
Kimura, S., Kitagawa, M., Makino, K., Masuda, S., Miki, T.,
Mizobuchi, K., Mori, H., Motomura, K., Nakamura, Y., Nashimoto, H.,
Nishio, Y., Saito, N., Sampel, G., Seki, Y., Tagami, H., Takemoto, K.,
Wada, C., Yanamoto, Y., Yano, M. and Horiuchi, T.
A 718-kb DNA sequence of the Escherichia coli K-12 genome
Corresponding to the 12.7-28.0 min region on the linkage map
DNA Res. 3 (3), 137-155 (1996)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Bacteria; Proteobacteria; gamma subdivision; Enterobacteriaceae;
Escherichia.
                                                                                                                                                    | S60 | S70 | S80 | S90 | 620 | G00 | G10 | G20 
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                                                                                                                                                                                                                                                                                                                                                                                 TCCATTC-CTACCAGCTGGC-TTAAA-ATCACCCTTT-----ATGAAGGCCGCAACCGACAGGTCAGGCGCA
GCCGGACGACGCTCGCTGGCAAAGCTGCGCAACGGCGTAACGCTGAACGACGGTCCCACCCTGC--CGGCT
                                    D90749 20284 bp DNA BCT 07-FEB-1999 Escherichia coll genomic DNA. (25.7 - 26.1 mln).
D90749 AB001340.
D90749.1 GI:1651562
Complete and shotgun sequencing; phoQ; phoP; purB; ycfC; ycfB; icdA; icd; icdA; ilt; int; xis; ycfK; ycfE; pln; ycfA.
Escherichia coll(strain:K12) DNA, clone:Kohara clone #240.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Direct Submission
Submitted (29-JUL-1996) to the DDBJ/EMBL/GenBank databases
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d90749 TOIG of: d90749 check: 928 from: 1
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Direct S
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ACCESSION
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KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           REFERENCE
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                                                                                                                                                 /protein_id="Baa35958.1"
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AGIEWKADSADAEKQELDLYICLRRVYRYYGGTPSPYKHPELTDMYIFRENSEDIY
                                                                                                                                                                                                                                                                                                                                             ANDRDSVTLVHKGNIMKFTEGAFKDMGYQLAREEFGGELIDGGPWLKVKNPNTGKEIV
TROVTADAFLACQILLARPAETDVIACMNLNGDYISDALAAQVGGIGIAPGANIGDECAL
FEATHGTARKYAGGDKVNPGSIILSAEMMLRHMGWTEAADLIVKGMEGAINAKTVTYD
FERLMDGAKLLKCSEFGDAIIENM"
//gene="lit"
14929. ..15007
                                                        product-"Isocitrate dehydrogenase (NADP) (EC 1.1.1.42)
(oxalosuccinate decarboxylase) (idh) (NADP+-specific icdh)
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3615 c 3679 g 3845 t
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similar to PIR Accession Number A30386"
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/transl_table=11
                                 'transl_table=11
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/gene="lit"
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Hirotada Mori, NARA Institute of Science and Technology, Res. & Edu. Center for Genetic Info., 8916-5 Takayama, Ikoma, Nara 630-01, 29an (E-mail:hmori@qtc.aist-nara.ac.jp, Tel:81-7437-2-5660, Fax:81-7437-2-5669) Collaboration Information:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /translation="MKKLLKLFFPLSLRVRFLLATAAVVLVLSLAYGMVALIGYSVSF
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /translation="MRVLVVEDNALLRHHLKVQIQDAGHQVDDAEDAKEADYYLNEHI
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LIRNNGKVVSKDSLMLQLYPDAELRESHTIDVLMGRLRKKIQAQYPQEVITTVRGGGY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Address: National Institute of Basic Biology, Okazaki, 444, Japan E-mail: kishori@nibb.ac.jp
Information operator:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /clone="Kohara clone #240"
/map="25.7-26.1 min"
/note="Nucleotide position 1191151-1211434 from the initiation site of ThrA (0 min.).-This clone is from complement(1. .327)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /product="Transcriptional regulatory protein PhoP."
/protein_id="BAA35961.1"
                                                                                                                                                                                                  The Japan E. coli genome DNA sequencing group
Members: (1995.4 - 1996.3)
Alba. H. Baba.T., Fujita, K., Hayashi, K., Honjo, A.,
Alba. H., Kanai, K., Kasai, H., Kashimoto, K., Isono, K., Itoh, T., Kimura, S., Kitagawa, M., Kitakawa, M., Makino, K.,
Masuda, S., Miki, T., Mizohouchi, K., Motomura, K.,
Nakamura, Y., Nashimoto, H., Nishio, Y., Oshima, T., Salto, N.,
Sampel, G., Seki, Y., Tagami, H., Takemoto, K., Wada, C.,
Headed by:
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /product="Virulence membrane protein pho0."
/protein_id="BAA35960.1"
/db_xref="G1:1651563"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Name: Hirotada Mori
Address: NARA Institute of Science and Technology,
Ikoma, 630-01, Japan
E-mail: hmori@qtc.aist-nara.ac.jp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /note="ORF_ID:0239#4
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                                                                                                                                                                 The Japan E.coli genome DNA sequencing project
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The Japan E. coli genome database http:bsw3.aist-nara.ac.jp.
Location/Qualifiers
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complement(1167. .2537)
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/db_xref="taxon:562"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Name: Takashi Horiuchi
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                                                                                                                                        Project
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                                                                                                         COMMENT
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YRDIPLLSRTHGQPATPSTIGKEMANVAYRMERQYRQLNQVEILGKINGAVGNYNAHI
AAYPEVDWHQFSEEFVTSLGIQWNPYTTQIEPHDYIAELFDCVARFNTILIDFDRDVW
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MRRYGIEKPYEKLKELTRGKRVDAEGMKQFIDGLALPEEEKARLKAMTPANYIGRAIT
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EQIAQSLEPVGELEKPQYRKIAEDLGLYTAKKKDSTGICFIGERKFREFLGRYLPAQP
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HEHPRLMSCGILAQQLHWONREPFTGTMRCTVKTRYRQTDIPCTVKALDDDRIEVIFD
EPVAAVTPGGSGVYKGEVCLGGGILEQRLPLPV"
complement(4378. .4839)
                                                                                                                                                                                                                                                          ÓKLAAHAAIKEVPAFAADAIGYLDAIVASFSEEDAARIKTIERTINHDVKAVEYFIKE
KVAEIPELHAVSEFIHFACTSEDINNLSHALMLKTARDEVILPYWRQLIDGIKDLAVQ
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                                                                                                                                    4.3.2.2)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /note="ORF_ID:0240#4
similar to SwissProt Accession Number P25745"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       similar to PIR Accession Number S19211"
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similar to PIR Accession Number I64156"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /transl_table=11
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 complement(2541, .3182)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        complement(2541. .3182)
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gene

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                                                                                                                                                                                                                                                                                                 RYKIKA"
                                                                                                                                                                                                                                                                                                                                                                                                                     /transl
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FEATHGTAPKYAGODKVNPGSIILSAEMALRHMGWTEAADLIVKGMEGAINAKTYTYD
FERLMDGAKLLKCSEFGDAIIENM"
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SLEVENYFCLONTHAAYERIYSNISCYPVGNEELIEALCTVMLOYLFGKNINVNLD
GESFSSILGDLLCDISRLTSN"
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LSERLYKEQGLDTOKLLGHKYQQQTDRYHDDRGKGWSKVAL"
complement(11338. .11583)
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(oxalosuccinate decarboxylase) (1dh) (NADP+-specific 1cdh)
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                                                                                                                                                                                                       similar to SwissProt Accession Number P08200"
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/gene="int"
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Residue Identity
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                                                                                                                                                                                                                                                           /translation="worn"/
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18052. .18681
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /product="Hypothetical 13.1 kd protein in pin 5'region."
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AKTNAATATIGRTGFTALPYMIGGIEDSYIIQMGWNAAKASASGGGGCNTVVFPVAFNN
ACVAVVANYDNVSAFINAVATGGTTTSFLLRCAAQTGSYYNWIAIGY"
complement(18788. .19670)
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AAFSAEEYPELAKAYPTNKLPDLRGEFIRGWDDGRGIDTGRSILSIOGYATEDHAHGL
PSRSTIVTDATINFYFDEIWVNSGTDIIKRGNTNDAGLPAPDYGTFKTYKQSYDGLGA
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /gene="ycfk"
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similar to SwissProt Accession Number P45581"
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complement(18788. 19670)
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18812. .19250
/note="ORF is interrupted by frame-shifting
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/gene="ycfE"
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20236. .20284
                                                                                            /transl_table=11
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GCTATAAT-GC-GGC--AA--T
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                                                                                                                                                                                                                                                                                                                                                                 .60 170 180 190 220
GCCGCAGTTTACCGACGAGGAGGCGGGGGCAGC--ACGCTG---AAG-GACTTTATCCC--CGTACAGGGAGTC
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TAAATC - - CATT - CCTACCAGCTGGCT - - TAAAATCACCCTTTATGA - - AGGCCGCAACCGACAGGTCAGGC
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Mismatches
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                                                                                          Type: N
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Matches = 361
Conservative Substitutions
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                                                                                         September 24, 2001 09:19
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CGAAATATGCCGGTCAGGACAAAGTAAATCCTGGCTCTA 6710 6710

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FastDB - Fast Pairwise Comparison of Sequences

> 0 < 0; 70 IntelliGenetics > 0 <

Results file us-09-252-691c-1394-inv.res made by sdavid on Mon 24 Sep 101 9:38:27-PDT. Results of the initial comparison of US-09-252-691C-1394' (1-669) with: File : portner691.seq Query sequence being compared:US-09-252-691C-1394' (1-669) Number of sequences searched: $\ref{postero}$ Number of scores above cutoff: $\ref{postero}$ K-tuple Joining penalty Window size PARAMETERS CPU 00:00:00 Unitary 1.00 Number of residues: Number of sequences searched: Number of scores above cutoff: Mean 249 107 Similarity matrix Mismatch penalty Gap penalty Gap size penalty Cutoff score Randomization group 54 Release 5.4 SCORE 0 100-Scores: Times:

30 32

SEARCH STATISTICS

Standard Deviation 219.36 Total Elapsed 00:00:01.00 Median 79

344036

The scores below are sorted by initial score. Significance is calculated based on initial score.

A 100% identical sequence to the query sequence was not found

The list of best scores is:

483

322

268

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Genome Project's World Wide Web site (http://www.genetics.wisc.edu). *** The E. coli K12 sequence and its annotations are periodically updated; this is version M54. No sequence changes. Annotation updates: updated gene identifications and products, all new functional assignments courtesy of Monica Riley; added promoters, protein binding sites, and repeated sequences described in reference 1. The unique numeric identifiers beginning with a lowercase 'b' assigned to each gene (protein- or RNA-encoding) are now designated as gene synonyms instead of labels. This should allow them to be searched for in Entrez as gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               MGLINVTLSERGTLMATLPANVPGDIPAIGFISHVDTSPDCSGKNVNPOIVENYRGGD
IALGIGDEVLSPVMFPVLHQLLGQTLITTDGKTLLGADDKAGIAEIMTALAVLQQKKI
PHGDIRVAFTPDEEVGKGAKHFDVDAFDARWAYTVDGGGVGELEFENFNAASVNIKIV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GNNVHPGTAKGVMVNALSLAARIHAEVPADESPEMTEGYEGFYHLASKKGTVBRADMY
YIIRDFDKKOFEARKRKMMEIAKKVGKGLHPDCYIELVIEDSYYNMREKVVEHPHILD
IAQQAMRDCDIEPELKPIRGTDGAQLSFMGLPCPNLFTGGYNYHGKHEFVTLEGMEK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /translation="MDKLLERFLNYVSLDTQSKAGVRQVPSTEGQWKLLHLLKEQLEE
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FRELPDWRIDDLMISFSVPGGGVGPHLDQYDVFIIQGTGRRRWRVGEKLQMKQHCPHP
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DYVLQRELGGNYYSDPDVPPRAHPADVLPQEMDKLREMMLELINQPEHFKQWFGEFIS
GSRHELDIAPPEPPYQPDEIYDALKQGEVLVRLGGLRVLRIGDDVYANGEKIDSPHRP
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /function="putative enzyme; Not classified"
/note="0408; 100 pct identical to 42 aa fragment
PEPT_ECOLISW: P29745; 93 pct identical to 407 residues of
409 aa PEPT_SALTY SW: P26311"

    .40
    /note="factor Sigma70; predicted +1 start at 1184959"

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SW:P27431 but has 3 additional N-terminal aa and 93
additional C-terminal aa"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           predicted +1 start at 1187488"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /note="central position to predicted promoter:82"
/bound_molety="PhoB predicted site"
155. .1381
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    10959
    organism="Escherichia coli K12"

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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      'function="orf; Unknown"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           complement(1430. .2560)
/gene="ycfD"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       complement(1430. .2560)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            complement(2627. .4087)
/gene="pho0"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /db_xref="taxon:83333"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /sub_strain="MG1655"
                                                                                                                                                                                                                                                                                                                                                   Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /EC_number-"3.4.11.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /transl_table=11
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /gene="pepT"
/note="b1127"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /note="b1128"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /codon_start=
                                                                                                                                                                                                                                                                                                                                                                                                                                              /strain="K12"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              'gene="pepT"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           .1381
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  protein_bind
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RPIEALAKEVRELEEHNRELLNPATTRELTSIJRNLLLKSERERYDKYRTTJTDLT
HSLKTPLAVLOSTLAKELRSEKMSVSDAEPVMLED ISRISOQIGYYLHRASMRGTLLS
RELPVAPLLDNLTSALNKYQRKGVNISLDISPEISFVGEQNDFVEVWGNVLDNACK
YCLEFVEISARQTBELYIVVEDDGFGIPLSRREVIEDRGQRVDTLRPGGGGVGLAVAR
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DKTTFRLLRGESNLFYTLAKWENNKLHVELPENIDKGSPTWTLIYDENGQLLWAGRDV
PWLMKMIQPDWLKSNGFHEIEADVNDTSLLLSGDHSIQQQLQEVREDDDDAEMTHSVA
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AAYPEVDWHQFSEERVTSLGIQWNPYTTQIEPHDYTAELFDCVARFNTILIDEDRDVW
GYTLJNHFRYRYTGIESSTWPHKVNPIDFENSEGNUGLSBANVLQHHASKLEVSRWQ
RDLTDSTYLAHFROLGYGYALIAYGYNGKRYSKLEVRRDHLDELDHWBYLAEPIQTV
MRRYGIEKPYEKLKELTRGKRVDAEGMKQFIDGLALPEEEKARLFAMTPANYLAEPIQTV
                                                                                                                                                                                                                                                                                                                                               VNVYPATSRMPKLTIVVVDTIPVELKSSYMVWSWFIYVLSANLLLVIPLLWVAAWWSL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /translation-"MRVLVVEDNALLRHHLKVQIQDAGHQVDDAEDAKEADYYLNEHI
PDJATVDLGELDEDGLSLIRRWRSNDYSLPILLTJARESWQDKVEVLEAGADDOYVTKP
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LIRNNGKVVSKDSLMLQLYPDAELRESHTIDVLMGRLEKKIQAQYPQEVITYRROGGY
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QKLAAHAAIKEVPAFAADAIGYLDAIVASFSEEDAARIKTIERTTNHPYKAVEFFLKE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /translation="MAKNYYDITLALAGICQSARLVQQLAHQGHCDADALHVSLNSII
DMNPSSTLAVFGGSEANLRVGLETLLGVLNASSRQGLNAELTRYTLSLAVLERKLSSA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   KVAEIPELHAVSEFIHFACTSEDINNLSHALMLKTARDEVILPYWROLIDGIKDLAVO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /gene="phop"
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/EC_number="2.7.3.-"
/function="enzyme; Global regulatory functions"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /function-"orf; Unknown"
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/function="enzyme; Purine ribonucleotide biosynthesis"
/note="f456; 99 pct identical to PUR8_ECOLI SW: P25739"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /gene="phop"
/note="factor Sigma70; predicted +1 start at 1189162"
complement(4927. .6297)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /product="transcriptional regulatory protein"
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/db_xref="GI:1787376"
                                                                                                                                                    /product="sensor protein Phog"
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/gene="ycfC"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          complement(4927. .6297)
/gene="purB"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 complement(4087. .4758)
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                                                                                                                          /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /transl_table=11
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/transl_table=11
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /gene="phoP"
/note="b1130"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /codon_start=.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /gene="purB"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /gene="ycfC
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/product="150c1trate dehydrogenase, specific for NADP+"
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ANDRDSVTLVHKGNIKFTFGAFKDWARAREREGGELIDGGPWLKVKNPNTGKEIY
IKDVIADAELQOILERPAETDVIACMMLNGDYISDALAAQVGGIGAPGANIGDECAL
FEATHGTAPKYAGQDRVNPGSIILSAEMMLRHMGWTEAADLIVKGMEGAINAKTVTYD
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complement(7006. .7033)
/gene="ycf8"
/note="factor Sigma70; predicted +1 start at 1191911"
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CCRWVSAEEILQASNLRSPLVAESIRCYQSGQRYPLEMIGDFNWPFTKGVI"
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VEGIPTQDALEALRNGVTLNDGPTLPAGAELVDEPAWLWPRNPPIRERKSIPTSWLKI
KGALDTLGNRINGLQRQLEHFDLQSETLMSAMAAIYVDVISPLGPRIQVTGSPAVLQS
PQVQAKVRATLLAGIRAAVLWHQVGGGRLQLMFSRNRLTTQAKQILAHLTPEL"
complement(6443. .6471)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /function="putative enzyme; Not classified" //function="putative enzyme; Not classified" (3 gaps) //note="fl53; This 153 aa ORF is 45 pct identical (3 gaps) to 57 residues of an approx. 160 aa protein MUTT_STRAM SW: p32091"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /function="orf; Unknown"
/note="f207; This 207 aa ORF is 66 pct identical (1 gap)
to175 residues of an approx. 248 aa protein Y694_HAEIN SW:
P44827"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /function="enzyme; Energy metabolism, carbon: TCA cycle"
/note="0416; 100 pct identical to IDH_ECOLI SW: P08200"
/codon_start=1
                                                                                                                                                                                                                                         /function="orf; Unknown"
/note="f383; 100 pct identical to fragment YCFB_ECOLI
SW:P25745 but has 152 additional N-terminal residues"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       9283. .9311
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97943. .10684
/gene="icdA"
                                                                                               /note="factor Sigma70; predicted +1 start at 1191348"
complement(6978. .8129)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /product-"putative phosphohydrolase"
/protein_id-"AAC74218.1"
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                                                                                                                                                                                            complement(6978. .8129)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  complement(8609. .9232)
/gene="ymfC"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                complement(8138. .8599)
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/note="b1135"
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                                                                                                                                                                                                                        /gene="ycfB"
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/gene="icdA"
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٩ 240 250 260 260 270 280 290 300 ACGITCAATACCAGCCGAGGGAGCGACGTTCACGCGTTGCCGA--GCTTTGCCAACGAC AACATCCCGCCATTCCCCGTTTGCCAGCGAGTCCAGCGTATAGCTGCCCATGGCGTAGCGAATGAGTCGCAG GCCTGGAGCACGCCGTCATTGGTAAGGACCAGCAGCCCCTCGCTGTCGCGATCCAGACGTCCCGCTGCGTAG TAGGGTTTATTGAACAGTATGACCCGCGTTGGCTGGGGTTCTGGCGTTCTTCTGGTGGCTTGTCGTGAGCTG TCAGTT - - - CTCCTT - AGGGGT 1.07 163 0 290 Length: 10959 September 24, 2001 09:14 Type: N Check: 1875 370 ı 440 498 Significance 504 Mismatches 580 150 220 360 9030 430 70 500 570 140 483 Optimized Score - 498
745 Matches - 504
8 Conservative Substitutions 210 350

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GGAKNLLI"
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Oshima, T., Alba, H., Baba, T., Fujita, K., Hayashi, K., Honjo, A.,
Ikemoto, K., Inada, T., Itoh, T., Kajihara, M., Kanai, K., Kashimoto, K.,
Kimura, S., Kitagawa, M., Makino, K., Masuda, S., Miki, T.,
Mizobuchi, K., Mori, H., Motomura, K., Nakamura, Y., Nashimoto, H.,
Nishito, Y., Saito, N., Sampei, G., Seki, Y., Tagami, H., Takemoto, K.,
Mada, C., Yamamoto, Y., Yano, M. and Horiuchi, T.
A 718-kb DNA sequence of the Escherichia coli K-12 genome
corresponding to the 12.7-28.0 min region on the linkage map
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A. (Silva), "Baba,T., Fujita,K., Hayashi,K., Honjo,A., Horiuchi,T., Ikemoto,K., Inada,T., Isono,K., Isono,S., Itch,T., Kanai,K., Kasai,H., Kashimoto,K., Kim,S., Kimura,S., Kitagawa,M., Makinoo,K., Maxi,M., Makinoo,K., Maxi,M., Mitakawa,M., Makinoo,K., Maxi,M., Makinoo,K., Maxi,M., Makinoo,K., Maxi,M., Makinoo,H., Mishio,Y., Oshima,T., Saito,N., Sampel,G., Seki,Y., Tagami,H., Takemoto,K., Wada,C., Tamamanoto,Y. and Yano,M.

The systematic sequencing of the Escherichia coli genome in Japan Unpublished (1996)

(bases 1 to 15007)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Bacteria; Proteobacteria; gamma subdivision; Enterobacteriaceae;
                                                                 9190
                                                                                                                                                                                                                                                                                                                                                                                                                                                         Escherichia coli genomic DNA. (25.6 - 25.9 min).
D90748 AB001340
D90748.1 G1:1651553
COMPLETE and shotgun sequencing; potB; potA; pepT; phoQ; phoP; purB; yefE; yefB; icdA; icd; icdE; llt.
Escherichia coli(strain:K12) DNA, clone:Kohara clone #239.
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Horluchi,T., Ikemoto,K., Inada,T., Isono,K., Isono,S.,
Itoh,T., Kanai,K., Kasai,H., Kashimoto,K., Kim,S.,
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Masuda,S., Miki,T., Mizobuchi,K., Mori,H., Motomura,K.,
Sampel,G., Seki,Y., Tagami,H., Nishio,Y., Oshima,T., Saito,N.,
Yamamoto,Y. and Yano,M.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Submitted (29-JUL-1996) to the DDBJ/EMBL/GenBank databases.
Hirotada Mori, NARA Institute of Science and Technology, Re
         9180
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       9170
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d90748 TOIG of: d90748 check: 3982 from: 1
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9130
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VERSION
KEYWORDS
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AUTHORS
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JOURNAL
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9120
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RLLDPLYFEVLLHSLNMALIATLACLVLGYPFAWFLAKLPHKVRPLLLFLLIVPFWTN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SLIRIYGLKIFLSTKGYLNEFLLWLGVIDTPIRIMFTPSAVIICLVYILLPFMVMLLY
SSIEKLDKPLLEAARDLGASKLQTFIRIIIPLTMPGIIAGCLLVMLPAMGLFYVSDLM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /translation="MCQSKKLNKQPSSLSPLVQLAGIRKCFDGKEVIPQLDITINNGE
FLTLLGPSGCGKTTVLRLIAGLETVDSGRIMLDNEDITHVPAENRYVNTVFQSYALFP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MGLINVTLERKGTLAATLPAAVPGDIPALGFISHVOTSPDCSGKNVNPOIVENYRGGD
IALGIGDEVLSPVMFPVLHQLLGQTLITTDGKTLLGADDKAGIAELMTALAVLOQKKI
PHGDIRVAFTPDEEVGKGAKHFDVDAFDARWAYTVDGGGVGELEFENFNAASVNIKIV
                              Address: National Institute of Basic Biology, Okazaki, 444, Japan E-mail: kishori@nibb.ac.jp
Information operator:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          HMTVFENVAFGLRMQKTPAAEITPRVMEALRMVQLETFAQRKPHQLSGGQQQRVAIAR
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NIYVNFAVEPGQKLHVLLRPEDLRVEEINDDNHAEGLIGYVRERNYKGMTLESVVELE
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    'product="Spermidine/putrescine transport system permease
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/protein_id="BAA35948.1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /clone="kohara clone #239"
/map="25.6-25.9 min"
/note="Nucleotide position 1185469-1200474 from initiation site of ThrA (0 min.).-This clone is complement[1..678)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /note="ORF_ID:0238#14
similar to SwissProt Accession Number P23860"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                similar to SwissProt Accession Number P29745"
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                                                                                                                                           Address: NARA Institute of Science and Technology,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /note="ORF_ID:0239#1
similar to PIR Accession Number A40840"
                                                                                                                                                                                                                                                                                                                                                                                    /organism="Escherichia coli"
                                                                                                                                                                         Ikoma, 630-01, Japan
E-mail: hmori@gtc.aist-nara.ac.jp
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                                                                                                                                                                                                                                                                    coli genome database
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/gene="potB"</pre>
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                                                                                                                                                                                                                                                           The Japan E. coli genome dat
http:bsw3.aist-nara.ac.jp.
Location/Qualifiers
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Name: Takashi Horiuchi
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                                                                                                                  Name: Hirotada Mor
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CDS

CDS

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/translation= WROFIISENTWQKTSFRNHQVKRFSSQRSTRRKPENQPTRVILF
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GKIITVDGDEIGEHQGLMYHTLGQRKGLGIGGTKEGTEEPWYVVDKDVENNILVVAQG
HEHPRLMSVGLIAQQLHWVDREPFTGTMRCTVKTRYRQTDIPCTVKALDDDRIEVIFD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /translation="MFKPHVTVACVVHAEGKFLVVEETINGKALWNQPAGHLEADETL
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GEEYCTAAADLADAQAVCDKLGIELHTVNFAAEYWDNVFELFLAEYKAGRTPNPDILC
NKEIKFKAFLEFAAEDLGADYIATGHYVRRADVDGKSRLLRGLDSNKDQSYFLYTLSH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /product="Isocitrate dehydrogenase (NADP) (EC 1.1.1.42)
(oxalosuccinate decarboxylase) (idh) (NADP+-specific icdh)
RDLTDSTVLRNLGVGIGYALIAYQSTLKGVSKLEVNRDHLLDELDHNWEVLAEPIQTV
MRRYGIEKPYEKLKELTRGKRVDAEGMKQFIDGLALPEEEKARLKAWTPANYIGRAIT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /product="Hypothetical protein in purB 5'region (orf-15)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            similar to SwissProt Accession Number P25745"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /note="ORF_ID:0240#7
similar to SwissProt Accession Number P08200"
                                                                                                                                                                                                                                                     similar to PIR Accession Number S19211"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            EPVAAVTPGGSAVFYNGEVCLGGGIIEQRLPLPV"
complement(10061. 10522)
//note="north: Di. 2240#5
similar to PIR Accession Number S64074"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /transl_table=11
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/note="ORF_ID:0240#4
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                                                                                             complement(8224. .8865)
                                                                                                                                          complement(8224. .8865)
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                                                                                                                                                                                                                 /note="ORF_ID:0240#3
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11357, 12607
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/transl_table=11
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                                                                                                                       /gene="ycfc"
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I AQQAMRDCD I EPELKP I RGGTDGAQLSFMGLPCPNLFTGGY NYHGKHEFVTLEGMEK
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ALASNIALTARENEGALEDPSFLAMLAALVNSGYWFFEG"
COMPLEMENT (4550. .6010)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /product-"Virulence membrane protein phoo."
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VNVYPATSRWPKLTIVVVDTIPVELKSSYMVMSWFIYVLSANLILVIPLLMVAAWMSL
RPIEALAKEVRELEEHNREILINPATTRELTSLVRNI.NRILKSERERYDKYRTTITDLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            HSLKTPLAVLQSTLRSLRSEKMSVSDAEPVMLEQISRISQQIGYYLHRASMRGGTLLS
SELBYPAPLLDNLTSALNKYQRKGWNSVBLDLSPEISFVGEQNDFVEVMGNYLDNACK
YCLEFVEISARQTDBELYIVVEDDGFGIPLSRREVIFDRGQRVDFLRPGQGVGLAVAR
EITEQYEGKIVAGESMLGGARMEVIFCRQHSAPKDE"
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FHIEEVMARWQALMRRNSGLASQVISLPPFQVDLSRRELSINDEVIKLTAFEYTIMET
LIRNNGKVVSKDSLMLQLYPDAELRESHTIDVLMGRLRKKIQAQYPQEVITTVRGQGY
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KVAEIPELHAVSEFIHFACTSEDINNLSHALMLKTARDEVILPYWRQLIDGIKDLAVQ
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AAYPEVDWHQFSEEFVTSLGIQWNPYTTQIEPHDYIAELFDCVARFNTILIDFDRDVW
GYIALNHFKQKTIAGEIGSSTWPHKVNPIDFENSEGNLGLSNAVLQHLASKLPVSRWQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MESEVDSRLVSHQDGKMQVSHGPFESYDHLGETNWSLLVQAVNHWHEPTAALMRPFRE
LPDWRIDDLMISFSVPGGGVGPHLDQYDVFIIQGTGRRRWRVGEKLQMKOHCPHPDLL
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                                                                                                                                                                                                                                           /note="ORF_ID:0239#3
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                                                                                                                                                    /gene="phoQ"
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/gene="purB"
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                                                                                          AVQVIVRIAELTAQRK"
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                                                                                                                                                                                                                     "dene="pho0"
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AUTHORS
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TITLE
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KEYWORDS
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                                                          AGIEWKADSADAEKVIKFLREEMGVKKIRFPEHCGIGIKPCSEEGTKRLVRAAIEYAI
NADROSVYLHVKONIMKFTEGAFKDWGYQLAREEGGELIOGGFWLKVKNDNTCKEIV
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10470 10480 10490 10500 10510 10520 10530 10540
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AACATCCCGCCATTCCCGTTTGCCAGCGAGTCCAGCGTAGGCGTAGCGTAGTCGCAG
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TCAGTT---CTCCTT-AGGGGT
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Matches = 504
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(sites) (sites) Alba,H., Baba,T., Fujita,K., Hayashi,K., Honjo,A., Oshima,T., Indda,T., Indda,T., Kajihara,M., Kanai,K., Kashimoto,K., Kimura,S., Kitagawa,M., Makino,K., Masuda,S., Miki,T., Mizobuchi,K., Mori,H., Motomura,K., Nakamura,Y., Nashimoto,H., Nishio,Y., Saito,N., Sampei,G., Seki,Y., Tagami,H., Takemoto,K., Wada,C., Yamamoto,Y., Yano,M. and Horiuchi,T. A 718 kb DNA sequence of the Escherichia coli K-12 genome corresponding to the 12.7-28.0 min region on the linkage map DNA Res. 3 (3), 137-155 (1996)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Submitted (29-TUL-1996) to the DDBJ/EMBL/GenBank databases.
Hirotada Mori, NARA Institute of Science and Technology, Res. 6
Bul. Center for Genetic Info.; 8916-5 Takayama, Ikoma, Nara 630-01,
Japan (E-mail:hmorl@qtc.aist-nara.ac.jp, Tel:81-7437-2-5660,
Fax:81-7437-2-5669)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             2 (sites)
Aiba.H., Baba.T., Fujita,K., Hayashi,K., Honjo,A., Horiuchi,T.,
Ikehot,K., Inada,T., Isono,K., Isono,S., Itoh,T., Kanai,K.,
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Yamamoto,Y. and Yano,M.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 The systematic sequencing of the Escherichia coli genome in Japan Unpublished (1996)
3 (bases 1 to 20284)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  D90749 20284 bp DNA BCT 07-FEB-1999 Escherichia coli genomic DNA. (25.7 - 26.1 min). D90749 AB001340 D90749 AB001340 Complete and shotgun sequencing; phoQ; phoP; purB; ycfC; ycfB; complete and shotgun sequencing; phoQ; phoP; purB; ycfC; ycfB; complete and shotgun sequencing; phoQ; phoP; purB; ycfC; ycfB; complete and shotgun sequencing; phoQ; phoP; purB; ycfC; ycfB; bicdA; icdA; icdE; lit; int; x1S; ycfE; plu; ycfA. Escherichia coli (strain:K12) DNA, clone:Kohara clone #240. Escherichia coli
                                                                                                                                                                                                                                                                                                                                                        TAGGGTTTATTGAACAGTATGACCCGCGTTGGCTGGGGTTCTGGCGTTCTTCTGGTGGCTTGTCGTGAGGTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 to: 20284
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ATAGCCTAATAAGGGGGATCTTTCATGACGGGAAACAATAGGGTAGTATTGACAA
11190 11200 11210 11210 11220
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  3. US-09-252-691C-1394' (1-669)
d90749 TOIG of: d90749
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GKIITYDGDEIGEHOGLAYHTLGORKGIGIGGTKEGTEEPWYVVDKDVENNILVVAQG
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                                                                                                                                                                                                                                                            Name: Takashi Horiuchi
Nddress: National Institute of Basic Biology, Okazaki, 444, Japan
E-mail: kishori@nibb.ac.jp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /clone="Kohara clone #240"
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                                                                                                                                                                                                                                                                                                                                                                                                             Address: NARA Institute of Science and Technology,
Ikoma, 630-01, Japan
E-mail: hmorl@gtc.aist-nara.ac.jp
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The Japan E. coli genome database http:bsw3.aist.nara.ac.jp.
Location/Qualifiers
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Name: Hirotada Mori
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /gene="purB"
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LETWRARVIERYYWTPQGGADGDYVVWAKEVPGITRAWTYRHLMGTGTVGVMIASSDL
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similar to PIR Accession Number G64034"
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LTTPVGGGIRSLNVALRQELDLYICLTROFRYRYQGTPSPVKHPELTDMVIFRENSEDIY
                                                                                                                                                                                                                                                                                                                                    AGIEWANDSADAEKTIKELREEMÄYKKIRPEPHOGIOIPENYHELLUMPHELLUMPHELLUMPHELLUMPHELLUMPHELLUMPHELLUMPHELLUMPHELLEYRALIEYAI
IKDVIADAFLOQILLERAEREYDVIACKNILNGYQLAREEFGGELIDGGPWLKVKNPNTGKEIV
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FEATHGTARKYAGQOKVNPGSIILGAEMMLRHMGWTEAADLIVKGMEGAINAKTYTYD
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(oxaloguccinate decarboxylase) (idh) (NADP+-specific icdh)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DVFKEROMYGEVPOTENTANGINGLED VONCHAUGHEN TANGING WANY VAS VLI
DALWYGGRIGDISRAKFSDTWDDHLHVIQEKTGSKIAIPLSLKLNAINWSLRDVVARC
RDYAVSAYLVHFRSTSQABERGAOVRANTLYNNFSKARDLARIDWGEGSPATFHEQRS
LSERLYKEQGLDTOKLLGHKTQQQTRXYHDDRGKGWSKVAL"
COMPLEMENT (11338. .11583)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /product="Repressor protein C2"
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9246. .10139
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Initial Score
Residue Identity
Gaps
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ATAGC
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complement(18788. .19670)
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1865. .18681
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LRSFLLRDGYPQGELKVSRISEAISGANGEYSHQLLAPVDNISIAKNELAVLGTISWT
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similar to SwissProt Accession Number P09154"
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invertible-p region of excisable element e14."
complement(19670...20209)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /gene_ring
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ORF_ID:0241#12
similar to PIR Accession Number S07956"
/product="Hypothetical protein P-239"
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/note="ORF is interrupted by frame-shifting
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /note="ORE_ID:0241#13
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20236. .20284
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20236, >>>-/
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18812. .1925
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ORIGIN
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X
TCAGTT---CTCCTT-AGGGGT
                                                                                              <u>AACATCCCGCCATTCCCCGTTTGCCAGCGAGTCCAGCGTATAGCTGCCCATGGCGTAGGGGAATGAGTGGGGA</u>
                                                                                                                                        120 150 150 GGTAGGGACCATCATCGCAGTGACTGTGGGTTCGGGCCTTCATAAAGGGTGATTTTAAG
                                                                                                                                                        CAGCTCCGCGCCGGCGGCAGGGCCATCATTTAAGGTTACGCCATGCGCAAGGCTTCAAGTGCGTTC 5080 5130 5140
                                                                                                                                                                                                                                                                                                                                                           GCCTGGAGCACGCCGTCATTGGTAAGGACCAGCAGCCCCTCGCTGTCGCGATCCAGACGTCCCGCTGCGTAG
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AAATTTGCCTTCTGCGTGCACCACGCAAGCAACGGTAACGTGCGGTTTAAACATTTGCATCCTTAATCTGT
4790 4800 4810 4850
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      <u> AATCGCTCAACCCGGTGTTTTCTAAAAGAAGTTTTCGTCATGGTATTTTTCAGGCGTTATCAATTGCCGCATT</u>
1.07
163
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Significance
Mismatches
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                  Conservative Substitutions
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Optimized Score
Matches
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483
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D90749 Length: 20284 September 24, 2001 09:19 Type: N Check: 928

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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      codon_start=
                                                                                                                                                                                                                                                                                                                                                   /gene="ypfB"
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                                                                                                                                                                                                                                VEQKSR'
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S Kunst.F., Ogasawara,N., Moszer,I., Albertini,A., Alloni,G., Azevedo,V., Bertero,M.G., Bessleres,P., Bolotin,A., Borchert,S., Boursier,L., Brans,A., Braun,M., Brignells.C., Borriss,R., Boursier,L., Brusch,C.V., Caldwell,B., Capuano,V., Carter,N.M., Choi,S.K., Codomi,J.J., Connerton,I.F., Cummings,N.J., Daniel,R.A., Denizot,F., Devine,K.M., Dusterhoft,A., Ehrlich,S.D., Emmison,P.T., Entian,R.D., Errington,J., Fabret,C., Ferrari,E., Foulger,D., Fritz,C., Fujita,M., Fujita,Y., Fabret,C., Ferrari,B., Galleron,N., Ghim,S.Y., Glaser,P., Goffeau,A., Golightly,E.J., Grandi,G., Guiseppi,G., Guy,B.J., Haga,K., Haleoth,J., Harwood,C.R., Henaut,A., Hibert,H., Holsappel,S., Hosono,S., Hullo,M.F., Itaya,M., Jones,L., Joris,B., Karamata,D., Kasahara,Y., Koningstein,G., Krogh,S., Kumano,M., Kurita,K., Lapidus,A., Lardinois,S., Lauber,J., Lazarevic,V., Lee,S.M., Levine,A., Liu,H., Masuda,S., Mauel,C., Medina,N., Mone,U., O'Reilly,M., Ogawa,K., Ogiwara,A., Oudega,B., Park,S.H., Parro,V., Pohl,T.M., Portetelle,D., Porvollik,S., Prescott,A.M., Parro,V., Pohl,T.M., Portetelle,D., Porvollik,S., Prescott,A.M., Parro,V., Pohl,T.M., Schlan,C., Schlan,E., Schlan,E., Roche,B., Rose,M., Sadaie,Y., Sato,T., Seror,S., Schroeter,R., Soffone,F., Sato,T., Takeuchi,M., Tanaka,L., Seror,S., Schroeter,R., Soffone,F., Sato,T. Taskeuchi,M., Tanaka,T., Tarkanakh,H., Tarkemaru,K., Tarkeuchi,M., Tanaka,T., Tarkanakh,H., Tarkemaru,K., Tarkeuchi,M., Tanaka,T., Tarkanakh,H., Tarkemaru,K., Tarkeuchi,M., Tanaka,T., Tarkanakh,M., Tanaka,M., Sadaie,K., Yata,M., Wanilers,P., Wipht,M., Wanilets,R., Vandelle,M., Vanilets,R., Vandelle,M., Vanilets,R., Vandelle,M., Vanilets,R., Vandelle,M., Vanilets,R., Vallati,M., Vanilets,R., Vallati,M., Vanilets,R., Vallati,M., Van
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Direct Submitssion
Submitted (18-NO'-1997) I. Moszer, A. Danchin, Institut Pasteur,
Regulation de l'Expression Genetique, 28 rue du bocteur Roux, 75724
Paris Cedex 15, FRANCE. E-mail: moszer@pasteur.fr,
adanchin@pasteur.fr Phone: +33 (0)1 45 68 84 41, Fax: +33 (0)1 45
                                                                                             BSUB0013 218470 bp DNA BCT 26-NOV-1997
Bacillus subtilis complete genome (section 13 of 21): from 2395261
to 2613730.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            The complete genome sequence of the gram-positive bacterium
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Yoshida,K., Yoshikawa,H.F., Zumstein,E., Yoshikawa,H. and
TOIG of: 299116 check: 4068 from: 1 to: 218470
                                                                                                                                                                                                                                                                                                                                                                          Bacillus/Clostridium group;
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                                                                                                                                                                                                                                                                                                                                                                       Bacteria; Firmicutes; Bacillus/Clostridi
Bacillus/Staphylococcus group; Bacillus.
                                                                   to: 218470
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complement(22. .696)
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complement(7. .696)
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                                                                from: 1
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                                                                                                                                                                                                                                                                                                                                                                                                                                          (bases 1 to 218470)
                                                                                                                                                                                                                                                Z99116.1 GI:2634723
                                                                   check: 4068
                                                                                                                                                                                                                                                                                                             Bacillus subtilis.
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DEFINITION
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TITLE
JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                    REFERENCE
AUTHORS
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REFERENCE
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KEYWORDS
SOURCE
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COMPJEMENT(1711. 3094)
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complement(1742. .3094)
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                                                                                                                                                                                                                                                                                                                                                                      complement(775. .951)
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COMPIEMENT(10267. 10836)
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FHKLRCEITQKSTDLWPQPDKWKARESVFHWMKHKYDINLYFESK"
complement(9594...10316)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PPLTIFFISDIHKRLIDQDLLEKARSHAPHLVIIGGDLAEGGVPSARIEENIKRLVHF
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DHYEBAIKELDESQUUNLVCHNPEIHEQINEDDGIDVILSGHTHGGQIRFGKFGPYEL
GKTGIVKNAAVLISNOYGTTKVPLRLGAEPETHIVTLCGPE
                                                                                                                                                                                                                                                                                           /note="similar to hypothetical proteins"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /protein_id="CAB14232.1"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 complement(9057. .9531)
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complement(9057. .9082)
/gene="ypbF"
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complement(8223. .9002)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              complement(9088. .9531)
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/transl_table=11
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ANANKOONNTPAKARKODAVAANMPGGFSNNDIRLLAQAVYGEARGEPYEGOVAIAAV
ILNRLNSPLFPNSVAGVIFEPLAFTAVADGQIYMQPNETAREAVLDAINGWDPSEEAL
XYENPDTATSPWIMGRPQIKRIGKHIFCE"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PTHQTFFSSSEKLEIGDVAFITENKKPVRIQALSYYREVVKKNIRVNAFEMVRKVTK
TQNNTFVIETSKEYYTPYCIIATGYYDHPNYMGYPGEDLERVFHYFKEGHPYFDKDV
VVIGGKNSSVDAALELVKGSRAVTVLYRGNEYSPSIKPWILPEFEALVNNGTIRMEFG
ACVEKITENEVVPRASEKELITIKNDFVFAWTGYHPDHPFLEKIGVEEDKETGRPFFN
EETMETNVEGVFIAGUNANEIFIENGRFHGGHIAAEIAKRENH"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TNSQIMAWMDEYSRIDEFNSPGFITGRPLVLGGSHGRESATAÄGVTICIKEAAKKRG
IDIKGARVVVQGFGRAGSYLAKFWHDAGAKVVGISDAYGGLYDPEGLDIDYLLDRRDS
FGTVTKLFNDTITNQELLELDCDILVPAAIENQITEENAHNIRAKIVVEAANGPTYLE
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VKWLTLSLVVPSLLHGSYDFILIFALSNWIYYMLPRWFFMWFGLRKAKKARSVNMMQV
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| Ab_xref="SHOTS" SPO736"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PMRLLTVKIPVRMDDGSVKIFTGYRAHNDSVGPTKGGIRFHPNVTEKEVKAVKALSIW
MSLKCGIIDLPYGGGKGGIVCDPRDMSFRELERLSRGYVRAISQIVGPTKDVPAPDVF
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /note="similar to glutamate dehydrogenase"/codon_start=1
                                                                                                                                                                                                                                                  /note="similar to hypothetical proteins" /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /note="similar to thioredoxin reductase"
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complement(5995. .7324)
/gene="ypcA"
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/gene="ypbH"
                                                                                                                                complement(4162. .4182)
/gene="ypdC"
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                                                                                    complement(4162. .4841)
                                                                                                                                                                                   complement(4185. .4841)
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/function="unknown"
                                                                                                                                                                                                                                          'function="unknown"
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                                                                                                                                                                                                                 dene-"ypdC
                                                                                                               /gene="ypdC
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/translation="monity revelopmental physical physical plane of the property of 
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                KKGVRLINCARGGIIDBAALLEALENGHVAGAALDVFEVEPPVDNKLVDHPLVIATPH
IGASTKERQINVAAQVSEBYLQFAKGIPVMSAINLPAMTKDEFAKIKPYHQIAGKIIGS
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GISSEEKISSESGYDNCISYKVYTGRRSTFTYTAHFGRRIVEINGFNIDFYPTG
HLVYIQHQDTTGVIGRVGRILGDNDINIATMQVGRKEKGGEALMMLSFDRHLEDKIVK
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TPFEDDEVETEKERKQKELSTRVHQPATFSITRODTLLKKLKESLKWSPEKVKFLS
DQNETGVRIGSYGFFETEISTPKOSKRSYIVQNKQGDFLVPSNHSSPTVKEAKKEME
SSQEDTTPLLQAGAVQSVTKKQKHLYMRFSKESEVDDSIAGILMIEGLLLTAKEFGF
                                                                                                                                                                                                                                                                                                                                                                                                                    LVRSATKVTEDLENKMTSLKIVGRAGVGVDNIDIDEATKHGVIVINAPNGNTISTAEH
TFAMISSLMRHIPQANISVKSREWNRTAYVGSELYGKTLGIVGLGRIGSEIAQRRGAF
GMTVHVFDPPLITEERAKKIGVNSRTFEEVLESADIITVHTPLIKETKGLLNKETIAKT
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/protein_id="CAB14242.1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /note="similar to negative regulator of sigma-X activity"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                complement(join(17540, .17555,17559, .18665))
/gene="ypuN"
complement(17559, .18665)
/gene="ypuN"
/function="unknown"
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/proficio_id="CABA14239.1"
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/db_xref="SWISS-PROT:P35136"
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                                                                        /EC_number="1.1.1.95"
/function="serine biosynthesis"
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/gene="aroC"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        complement(16680. .17447)
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/gene="sigx"
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/gene="sigx"
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PWHCHGAAHYQQAAGVLWKRIASLLVQVLSHKQQGSRQYIPYTKDHKTLHWVKKYLSRH
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HNOLDVICCTNAFOGKVDKPDIRVIHFHLPQTAEAFWGEIGRAGROGKPSVSITLRA
PGDFELQEQIIQMESVTAEEIADVIRVLEKTEERDERRLRDVLLQYGVGETQARMMIH
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AKGLAVSLLLGTAAMTIIMSILNYVLILPAYTWFLHSPALSDSALKTAVVAGILPFNM
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LPCCSHCGFDLSLYEQKGERSKMAPLDSWSSELHRIFSLQTVGELN"
complement(12379. .13437)
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VEVPEVLEEDMIDAFEGCPTDSIKVADEPFEGDPLKFE"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /translation="MSLNYFDIMVLDCLCKINGERSGSAVFHLFKGKRSSQTIQDAGL
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /note="alternate gene name: ypbA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        IKGIVITVVFSLIFIKLKPWIEQQRSAHIH"
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complement(13967. .13982)
/gene="ypaA"
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/gene="ypzE"
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13703. .13951
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13703. .13951
/gene="fer"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /translation="merlokviahagvasrskaeelikegkvkvngkvytelgvkvyg
ØDgibvoklekvbereevytellkrekgvisaaolokskvyvydperniporiytelglld
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PAKAKLLSLDKKKQTSIIQLTIHEGRNRQVRRMFEAIGHEVIKLKREEYAFLNLRGLH
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ALGWTTDLIAVYGPDSFIGRLASVMQGSTDTTLYVLTVYFGAVGIKKMGDALKVGLLA
                                                                                                                                                                                   GLIIÈLIGAMLRFVPGMYVDETLWVREGETAAIPGTDGKYYLKNNQFSVETYNSKTEK
KYRDAAIDRYGDGRYAKNFQTDAVLYKREGKTYVEGRAVLEKYVEEDIRVQPLRFDS
FSYVQADYKENQLOGWYFQLIDKRKKSFGSLKINLLDPDSYVDLGNOYKVETASYLLD
DFYRNQDGEPSTKTKIPNNPAFVFNIITPDKPKGEKSFVAIQETIEGSGNNKYKLKFD
                                                                                                   SOTYNKTIIDKIWNFFSSYKVGIWLIVITLAASAFGTIFPQEAYLPPGAQADTYYKBO
YGFGQLYYLLGFHHLYGSWWYLLLIASIGISLVICSLDRVIPLYRALKNQGVRRSPA
FLRRQRLFSETVTVLNGESKEKIVTLLKKKHYRIREKEGSILAEKGRFSRWGPYVNHI
                                                                                                                                                                                                                                                                                            HVETKNITGLTVRKDLTLMVLAVGGAIFMIGVIQGMYWQHRRIWLHSQDGAVMVAGHT
NKNWFGLKKDLAFILADSGLTEPVDQKELIKTQK"
Complement(24777. .25322)
                                                                               /translation-"MKQVKCECGHINPVGTVLCESCGRALQETQPPLADMRYDGSARR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       O
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /product="essential protein similar to cytochrome biogenesis protein"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /function="required for spore core dehydratation"
/note="alternate gene name: ypuK"
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/gene="ypuL"
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complement(26779. .27369)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CDS
                                                                                                                                                                                                                                                                                                                                                                                                                 CDS
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /function="activation role in global regulation of aerobic and anaerobic respiration (resA, ctaA, qcrABC, fnr)" /note="alternate gene name: ypxD"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /transl_table=11
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YIVKPFSPREVVLRVKALLRRASQTSYFNANTPTKNVLVFSHLSIDHDAHRVTADGTE
VSLTPRVYELLYFLAKTPDKVYDREKLLKEVWQYEFFGDLRTVDTHVKRLREKLNKVS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DIASSEEDRKEIAQIIYDESLRMGRLVNDLLDLARMESGHTGLHYEKINVNEFLEKII
RKFSGVAKEKNIALDHDISLTEEEFWFDEDKMEQVFTNLIDNALRHTSAGGSVSISVH
SVKDGLKIDIKDSGSGIPEEDLPFIFERFYKADKARTRGRAGTGLGLAIVKNIVEAHN
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DLTQLANKVAVILENHEDQALARSITWELADNLFSIAJIQDEKNHWYSPNDKNRLSSJ
TVEQIQHDKDLNKALKDHKKVSKRTGLSDTDTDNERLIVGVPYEKDGKKGMVFLSQSL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    IPILTODEIGELATAFNOMGROLNFHINALNOEKEOLSNILSSMADGVITINIDGTIL
VTNPPAERFLOAWYYEONMNIKEGDNLPPEAKELFONAVSTEKEOMIEMTLOGRSWVL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          LMSPLYAESHVRGAVAVLRDMTEERRLDKLREDFIANVSHELRTPISMLQGYSEAIVD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           LAVKDTTKHTTRY I FLAAGIAIVLTTFFAFFLSSRVTY PLRKMREGAQDLAKGKFDTK
                                                                                                                                                                                      /function="involved in global regulation of aerobic and anaerobic respiration"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   'product="essential protein similar to cytochrome c
                                                                                                                                                                                                                                                                                                                         /product="two-component sensor histidine kinase"
/protein_id="CAB14243.1"
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                   complement(join(19326. .19346,19389. .21158))
/gene="resE"
complement(19326. .19346)
LRKHMELLREELMDDEVRMERRTDKGVVKSTSGS"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /note="alternate gene name: ypxC"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PERAKKIVTVWGVGYKFEVGAE" complement(21958. .23016)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /gene="resB"
complement(23152. .24780)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                complement(21155. .21877)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               complement(21958. .23016)
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                                                                                                                                   complement(19389. .21158)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   complement(21155. .21877)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GSITVHSRIDKGTTFSFYIPTKR"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       biogenesis protein"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MFNLIFVNLVLAGLHSYA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /codon_start=1
/transl_table=11
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /gene="resD"
                                                                                                            /gene="resE"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /gene="resD"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /gene="resC
                                                                                                                                                                  /gene="resE
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                                                                               terminator
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/translation-"MYPKAYIDYLVEFHATRDYFECHEILEEYWKEDPPKKRKRYWVG
FIOLAVALYHHRRONTAGAKRLMANSIRILGAEHRAVEDLGIDHGRLLELMOSVYEQI
ETVSAYKSIILPIKDEKLEEACRIECRKKKYTWGQPSALSNIFLIDKHRLRDRTDVIR
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FLWKEDEDIVGAIGVEKKDSEVEIRHISVNPSHRHQGIGKQMMDALKHLFKTQVLVPN
ELTQSFFERCQGQDQDISYNN"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TNDIDVAWVPGAFEIPFAÅKKMAETKKYDAIITLGTVIRGATTHYDYVCNEAÅKGIAQ
AANTTGVPVIFGIVTTENIEQAIERAGTKAGNKGVDCAVSAIEMANLNRSFE"
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/translation="MFHPIEEALDALKKGEVIIVVDDEDRENEGDFVALAEHATPEVI
NFMATHGRGLICTPLSEEIADRLDLHPMVEHNTDSHHTAFTVSIDHRETKTGISAQER
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LNQIAAEGRGVLLYLRQEGRGIGLINKLKAYKLQEQGYDTVEANEALGFLPDLRNYGI
GAQILRDLGVRNMKLLTNNPRKIAGLEGYGLSISERVPLQMEAKEHNKKYLQTKMNKL
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CEIMNEDGTMARVPELIEIAKKHQLKMITIKDLIQYRYNLTTJVEREVDITLPTDFGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /codon_start=1
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3.4-dihydroxy-2-butanone 4-phosphate synthase"
/protein_id="CAB14258.1"
/db_xref="GI:2634761"
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/gene="ribT"
/gene="ribT"
/function="riboflavin biosynthesis"
/note="alternate gene name: ribD"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /product="riboflavin synthase (beta subunit)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /function="riboflavin biosynthesis"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /function="riboflavin biosynthesis"
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/Funder="2.5.1.9"
/Function="riboflavin biosynthesis"
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/gene="ribH"
                                                                                                                                                                                                                                                                                                                                                                                                    complement(31355. .31378)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /gene="ribA"
complement(32363. .33559)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     complement(32363. .33559)
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/gene="ypuF"
/function="unknown"
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                                                                                                                                                  /codon_start=1
/transl_table=11
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                                                                                                                                                                                                                                                                                                                                                                        EREKEIERRKKSRD'
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                                                                                                                                                                                                                                                                                                                                                                                                                           /gene="ribT"
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                                                                                                                                                                                                                                                                                                                                                                                                       terminator
           gene
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MSVLVFWLGLMKIAEQSGLLDIFSRMCRPFISKLFPDIPPDHPAMGYILSNLMANFFG
LGNAATPLGIKAMEQMKKLNGNRSEASRSMITFLAVNTSCITLIPTTVIAVRMAYSSK
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YLNQTTLESLQAELPIEKGYCCDVLSTLRRMAVFCEGGAEACRRLLMQEPFQEARAEK
TLYNVYHQCIEEFFWPKKDTWCENSRASYTGVSAIEFYHAVPASLEQLLLPLSAAFLK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /translation="MOLDIVWWAIVPALLYAAGDEGLTKKOLLTVLEIEEPELNTIM
ADVADEYRGDTRGIELIEYADTYMLSTKKDFAPYLKKLIEVPSKGLSQASLEVLAIVS
YRQPITRAEIEEIRGVKSERILHSLVAKALLCEVGRADGPGRAILYGTTPTFLEQFGL
KTLDELPPLPENAEEDVLQEEADLFFENFNQTFEDIK"
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VHTMRYLELDIASSYLVMAATLLSIKSRMLPRQEEELFEDELLEEEDPREELIEKLI
STRYKVDAAKDLKEREEERGKSFTKPPSDLSEYAKEVKQSEGKLSVTVYDMIGAFQKV
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RVLYAKDEHQKRRIASITKIMTAVLAIESGKMDQTVTVSANAVRTEGSAIYLTEGGKV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   KLKDLVYGLMLRSGNDAAVAIAEHVGGSLDGFVYMMNQKAEQLGMKNTRFQNPHGLDD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          HENHYSTAYDMAILTKYAMKLKDYQKISGTKIYKAETMESVWKNKNKLLTMLYPYSTG
GKTGYTKLAKRTLVSTASKDGIDLIAVTINDPNDWDDHMKMFNYVFEHYQTYLIAKKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DIPKLKGTFYESKAFIKRDITYLLTEEEKENVKINTTLLKPKKAWEKDASKIPDIVGH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /note="similar to hypothetical proteins from B. subtilis" /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MEIMFNDATIAKVPIXYENERHOKPKKOFFETFKSIFLNAAGGAKWSI"
complement(28601. .28621)
                                                                                                                                                                                                                                                       /function="required for spore cortex synthesis (peptidoglycan biosynthesis)"
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(penicillin-binding protein 5*)"
(protein id="CAB14251.1"
(db_xref="G1:2634754"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /note="similar to hypothetical proteins" /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /note="similar to hypothetical proteins"
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complement(27357. .28505)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /db_xref="SWISS-PROT:P35154"
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complement(28628. .29167)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 complement(29222. .29815)
                                                                                                                                                                    complement(27357. .28505)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        complement(28601. .29167)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  complement(29222. .29815)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              complement(29805. .30560)
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CDS

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complement(48177. .48617)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              complement(47398. .48165)
/gene="sigF"
complement(47398. .48165)
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complement(48177...48617)
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                                                                                                                                                                                                                                                                                                                   complement(45775. .46227)
                                                                                                                                                                                                                                                                                                                                                /gene="spovAC"
complement(45775. .46227)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          complement(46239. .46664)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           complement(46674. .47276)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (stage V sporulation)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /codon_start=1
/transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                             /gene="spovAC"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /codon_start=1
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                                                                                                                                                                                                                                                                                     GGAS"
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                                                                                                             OKVLDEMNVPDNATTVTVTNKEEHEYLGKYISNAQIGSRAISSSSITIAKKGSGLNVE
THNISGITDEMYLNALMTAGVKDAKVYTAPFEVSGTAALTGLIKAYEVSSDBAISED
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NVTLTDSGKNQLVSLFNKMKNADIDMGQVSDQLDKAKDKITKFIESDEGKNFIQKVID
FFVSIWNATVSIFK"
40897. .40912
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EAHTHDY ITTGQEDSKFGFDLHNGQTERAIEQVLQSEHIQLLGVHCHIGSQIFDTAGF
VLAAEKIFEKLLDEWRDSYSFYSKVIALGGGFGIRYTEDDEPLHATEYVEK IIEAVKEN
ASRGFDIPEIJNIEPGRSLYCKOBAGTTLYTVGSOKEVPGVRQYVAVDGGMNDNIRPALY
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SMANNYNRIPRPAVVFVENGEAHLVVKRETYEDIVKLDLPFKTGVKQ"
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TDQVLSGLVAYIVEGAGFAFIIDVRSYFGRNPEEPDFEKYVGARDGFVENIVVNTAL
TRRETERLKVKWMTKVGFRSKTDLSICYIEDIADPDLVEIVEKEIASIDVGCLMAD
KTVERFIDVRQSYNPFFLVKYTRREDVAANHVLEGHVIIIVDFSPSVIITPTTLEHHVO
HAEEYRQAPSVGTFLRWVRFFGILASTLFLPIWFLFVLQPDLLDPDNMKFIGLNKDTHI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           FGIYDKFIEFAGGGAIVPIVSFGHSLLHGAMHQAHIHGFIGIGMGIFELFSAGISAAI
LFAFIVAVIFKAERLSADMTYRKVILTUTDGDYVAAKTIETAASKVGGECISGSKGNP
STREGAELVKLLASAYEDVFVAMFDDSGLOGEGPGEALTYVATHESIEVLGYIAVAS
KTHQAEWTRVDVSIDRNGEITEYGVDKVGEREFDDHRMSGDTVYCLDKLDLPLTIGIG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PIILQIFLADLGIEFLRMAAIHTPTALSTAMGLIAAVLIGQIAIEVGLESPEVILYVS
AATGOTFTPESELSLATHUPESCPHDTRCFISYRRARRIYSANYAMASIKSLQTPYL
WPLIPFNGKALWOYLYRTARFGAKKRPSIVHPKNRLRQPTNS"
COMPIEment (43773...44744)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /protein_id="CAB14272.1"
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                                                                                             /translation="MKKIWIGMLAAAVLLLMVPKVSLADAAVGDVIVTLGADLSESDK
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/note="mutants lead to the production of immature spores
(stage V sporulation)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /gene="spovAE"
/note="mutants lead to the production of immature spores
(stage V sporulation)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /gene="spovAD"
/note="mutants lead to the production of immature spores
(stage V sporulation)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DIGKMGRKDDISKGSPITMKAVEFILERSGYHAGPQGRENSGLSESS"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /product="diaminopimelate decarboxylase"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /function="lysine biosynthesis"
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complement(43773. .44744)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         complement(42344, .43822)
                                                                                                                                                                                                                                                                                                                                      complement(40919. .42238)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /gene="spovAF"
complement(42344. .43822)
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/transl_table=11
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                                                                                                                                                                                                                                                                                  40897. .40912
/gene="ypuA"
                                                                                                                                                                                                                                                                                                                                                                             /gene="lysA"
                                                                                                                                                                                                                                                                                     terminator
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gene

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LSMGFIRCFGKGRKERIVPIGEAAASAIEEYMTKARGKLLKNNVSDALFLNHHGKQIS
RQGFWKNLKKIALEAGIKKELTPHTLRHSFATHLLEDGADLRAVQEMLGHADISTTQI
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complement(54371. 55015)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /product="integrase/recombinase"
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MIFLKGIVVGFTVGFLVNQMGVSGFFLSFVSVLPQNVLLIPAYLIMGTCAIAFSLKLI
RQLFVKRSLHDAPIQWFGRYAFVLLVILFLALISSLFEAYLSPVLMEKLISRLF"
                                                                                                                                                                                                                                                                                                                 FKVFPEGFPDELLQELEKRSGRKIIGNKPASGTAĪLDELGQEHWETGALIVYTSADSV
LQIAAHEEVVPLEELKRICETARELTLDPKYMYGRIIARPFVGEPGQFKRTPNRHDYA
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GLHMPNMAKLGLGLIEDIKGVEKTEHPLAYYGKLQEASNGKDTWTGHWEIMGLYIDKP
                                                                                                                                                                                                                                                                                                                                                                                                    TGLSFANLVDFDALFGHRRDPEGYGRALEEFDARLPEVFGKMREDDLLIITADHGNDP
IHHGTDHTREYVPILAYSKKHKKAQMLPLADTFADIGATIADNFQTNKPKYGKSFLSL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DWNHVTRIHIIQYLKHLKDSGKSGKTSARHLASİRSFHQFLLREKVTDKDPSVHIETQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /note="similar to transcriptional regulator (Fur family)"
                             ribose-5-P/deoxyribose-5-P (purine nucleoside salvage)"
/note="alternate gene name: yqkN"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /gene="spoilM"
/function="required for dissolution of the septal cell
wall (stage II sporulation)"
/codon_start=1
     /function="conversion of ribose-1-P/deoxyribose-1-P to
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /note="alternate gene name: ykgM"
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/transl_table=11
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complement(52543. .52560)
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complement(53771. .54258)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /gene="yqki"
complement(53771. .53791)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           complement(52560. .53450)
/gene="ripx"
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complement(53809. .54258)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           complement(52543. .53450)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            complement(55116. .55331)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /function="unknown"
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/function="unknown"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /gene="yqkK"
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/function="cleavage of guanosine or inosine to respective
bases and sugar-1-P molecules (purine nucleoside salvage)"
/note="alternate gene name: yqk0"
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LERSGMGFTIMENFMDDVSIDSSPEMGTTIRLTKHLSKSKALCN"
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     of
II
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                                                                                                                                                                                                                                                                                                                                                                                                                                     complement(48614. .48967)
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64224. ..64245
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EDENVEELKSSLONFEPLINGT FALTATUTULAMKRESMPVIVIGALLGAIRAVVFO
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                                                                                                                          terminator
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complement(65842. .66165)
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CDS

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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /protein_id="CAB14313.1"
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                                                                                                                                                                                                                                            /gene="yqj0"
complement(74971. .75750)
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77120. .77956
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /codon_start=1
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /gene="yqjP"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /gene="yqjo"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    terminator
                                                                                                                                                                                                          gene
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FSPLCSLMIGNVMYSISMA.FTVSHGVPSYYMIVITFTIGEVLLFSMMDLYVDQIAKP
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71940. . 72131
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complement(72518. .73399)
                                                                                                                                                                                                                                                                                                                                                                                            SYACLVIAASSSVGILASFYGGYISKFGRRNMALVSIFGWALVFAGFAASNIWVFF
VVNALNGLCKSLFEPASKALLSDWTEEKTRLLVFNLRYAAINIGVVFGPVLGLYFGSS
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RFRLLRETAFQNPDSYFHKFKDLSDQEADEMAASIWESVNRPNLYENILPTKFRSDLI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /translation="MSVHSEVIHALIKDPFIQKLIDAEPVFWANSGKKEGPLPRADEW
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complement(73549. .74895)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    LRKGDGHKVEEVLVRRV"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /transl_table=11
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VESYQGALRQVISLAVAQGVPVPSFSSALAYYDSYRTAVLPANLIQAQRDYFGAHTYE
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VOSIGVYKLKKTRDPEKQRELQHENKLIVĞEHNINDLAMCIDHLIQSPENIGLEYAIR
STPEIASHSFLWESLĞQSDILMSLSAGIMYPVQAYIAQKLSAKYSAVPONPAAQOSAK
LMVFIFPVMMTIFSLNVPAALPLYWETSGLFLTVQNIVLQMTHHKSKKTAALTESVK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TQRRNKELAESGIHFIGTGVSGGEEGALKGPSIMPGGQKEAHELVKPILEAISAKVDG
EPCTTYIGPDGAGHYVKMVHNGIEYGDMQLISESYFIIKQVLGLSADELHEVFAEWNK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GELDSYLIEITADIFTKKDEETGKPLVDVILDKAGQKGTGKWTSQSALDLGVPLPIIT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ESVFARFISAMKEERVKASGLLSGPEVKPVTENKEELIEAVRKALFMSKICSYAQGFA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /translation-"MPGKSRIIFHIDMNSFYASVEMAYDPALRGKPVAVAGNVKERKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TVTCSYEARARGVKTTMPVWQAKRHCPELIVLPPNFORYRNSSRAMFTILREYTDLV
EPVSIDEGYMDMTDTPYSSRALETAKEIQSRLQKELLLPSSIGIAPNKFLAKMASDMK
     LGVEDRARYYEKSGALRDMVQNHIMQMVALLAMEPPIKLNTEEIRSEKVKVLRALRPI
                                                                                                                                                                                                                                                                                                                                                                                                        6-phosphogluconate dehydrogenase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /note="similar to DNA-damage repair protein"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /note="similar to lipoprotein SpoIIIJ-like"
                                                                                                        ISETWAANKTLSPNYESGSMGPKESDDLLVKDGLHWWNI
84608. .84635
/gene="yqjj"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /note="similar to hypothetical proteins"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /db_xref-"SWISS-PROT:P54545"
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complement(86237. .87481)
                                                                                                                                                                                                    complement(84681. .85937)
                                                                                                                                                                                                                                                            complement(84681. .84706)
                                                                                                                                                                                                                                                                                                                     complement(84717. .85937)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /protein_id="CAB14319.1"
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(pentose phosphate)"
                                                                                                                                                                                                                                                                                                                                                  /gene="yqji"
/function="unknown"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /function="unknown"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              88706. .88732
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88880. .89509
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                                                                                                                                                 terminator
                                                                                                                                                                                                                                                            terminator
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                                                                                                                                                                                                                                                                                                                     CDS
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COMPLEMENT (81975. .82898)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /translation="wkTnQQPKAVIVIFGATGDLAKRKLYPSIHRLYQNGQIGEEFAV
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COMplement (94543. . 95265)
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                                                                                                           complement(93504. .94472)
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complement(92922...93452)
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COMPLEMENT(90781. .92301)
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complement(89648. .90763)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           complement (92298. .92720)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              complement(92922. .93452)
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complement(103065. .104057)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (2-oxoisovalerate dehydrogenase alpha subunit)"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       YSLILSTSLVFLLTTVHSYVAILLVTVTVFVGFDLMRPAVTTYLSKIAGNEOGFAGGM
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99870. .100709
//gene="marr"
99870. .100709
//gene="bmrR"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /function="positive regulation of the bmrUR operon"
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                                                  complement(97034. .97471)
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98628. .99797
/gene="bmr"
98628. .99797
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97634. .98527
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terminator
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complement(111243. .112179)
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                                   KGLSQQALRALSAYHWPGNVRELENVLGRAMIFLNPHMEWIEKDHLPVFELEQKENDT
DQGTGFDFPDIEGEKLSVAVEKFEAHLIQQTLEKHHFNRTKTAKALGVSIRNLYYKMD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ARTDARAQEGLDAAIKRSEAYIEAGADAIFPEALQAENEFRQFAERIPVPLLANWTEF
GKTPYYRADEFEDMGFHWYIYPVTSLRAAAKACERMFGLMKEHGSQKEGLHDWQTRKE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /translation="MPKTDRVIEEITDYVLEKEITSAEAYTTAGHVLLDTLGCGILAL
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /note="similar to phosphoenolpyruvate mutase"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /note="alternate gene name: yqiP"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /note="alternate gene name: yqio"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /gene="mmgE"
complement(112197. .113615)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /db_xref="SPTREMBL:032015"
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/gene="yqzF"
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                                                                                                                             KYGLANEGMQ"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AAKAAFGTDSLEGKTIAVQGVGNVAYNLCRHLHEEGANLIVTDINKOSVORAVEDFGA
RAVDPDDIYSQDCDIYAPCALGATINDDTIKQLKAKVIAGAANNQLKETRHGDQIHEM
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ADKLAEERIERMRKSKOFLÇNGHSYLSRR"
complement(107741. .108640)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            KAVLNRQEGLRSASVLSHVAVFDIPDFDRLMFVTDSAMNIAPSLEELRQILQNAVHVA
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RFIYDAMAYQVAKEIGAASAALKGEVEAIVLTGGLAYGKSFVSAIRSYIDWISDVLVY
PGENELOSLAQGALRVLQGEEQSKQYRIE"
                                                                                                                                                                                                                                                                                                                                                                                                                                                             RFDRIIDQYEFRKNHILETLHBQGINISKFDAVCARGGLLRPIEGGTYVVNDEMIEDL.
KSGYAGQHASNLGGIIAREIADGLNIPSYIVDPVVVDEMSVLAKVSGMPEIERKSIFH
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PIKEVIPSTKMPRILKTRVPEYNQKQLLGDHLQIVTTRLPIIDEGGRLLGALCVFKDI
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IGKPANTDISEGESMHLKVLETRRPVRGVRAKVGPNEKEVIVNVAPVIVDGILKGSVG
VIHDVSEIKMLTAELNRARQIIRTLEAKYTFDDIIGKSEQMLVALEQAKLGAKTPATI
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GGKKGLFEEANNGSIFLDEIGELTQNMQAKLLRVLQEKEIVRVGGTKAIPVNVRVIAA
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                                                                                                                                                        /note="similar to branched-chain fatty-acid kinase"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /note="similar to phosphate butyryltransferase"
/codon_start=1
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /note="similar to leucine dehydrogenase"
/codon_start=1
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complement(106635. .107729)
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complement(107741. .108640)
                          complement(105525. .106616)
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complement(119582. 119875)
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VLTSDVLYQADRYIASIPASGYHPKINSPGVTDEVLKKMRNGLIKVRPYTVNRPEDMK
RLIEAGADRMFTDFPERLRHC"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /traislation="mekikvcvaddnrelvsllseyieggedmevigyaruggelsl
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   IVVIHDERLNRTTSLKGFVKDTAYDEVKTANAAAGHDQAYSDIKVPLLEDVLSWAVKK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (negative regulation of abrB, kinA, kinC, spoOA; positive regulation of spoIIA, spoIIE, spoIIG) (stage 0 sporulation)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /function-"central role in the initiation of sporulation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /note="alternate gene name: spoOC, spoOG, spoIIL, sof-1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /note="similar to NADH-dependent flavin oxidoreductase"
                                                                                                                                                                                                                                                                               /note="alternate gene name: yqil similar to N-acetylmuramoyl-L-alanine amidase"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /transl_table=11
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /note="alternate gene name: yzpA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  complement(122041. .122844)
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                                                                                                                           complement(118947. .119567)
                                                                                                                                                                                     complement(118947. .119567)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    complement (119582. .119875)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               similar to lipoprotein"
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LEKVNVNGGAIALGHPIGASGARILMTLYYELKRGGGLGVAAICSGAAQGDAVLVQV
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                                                                                          complement(114782. .115918)
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                                complement(114782. .115918)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             LRKYVKAGWLGKKSGRGFYDYEEKTS"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /gene="yq1K"
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CDS

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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /function="unknown"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               complement (129877. .130695)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         complement(130685. .130849)
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TYQGGYQRYVKLLKKLMCLSESEGEMAHCLDLIQFQLEETESAKLELNEDGQLQERQ
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DQIENRDSHLQSLKKELDSVGKDVAVEAANVSQIRTTWAKKLADEIHRELKSLYMEKS
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KQADQVKTTG"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MNDVAPFIQKAGKTGESLDLLIKRDKQKIKTKLIPEKDEGEGKYRIGLYIRDSÄAGIG
THTYEPKYKKKGALGHVISDMDTKKPIVVENGEIVKSTVTSIEKGTGGNPGEKLARF
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HVFVNDPTSGYGVHIEWMLSEAGIDIYGKEKAS"
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                                                                                                                                                                                                              /function="intercompartmental signalling of pro-sigma-K processing/activation in the mother-cell; essential for spore cortex and coat formation (stage IV sporulation)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /function-"negative regulation of arginine biosynthesis and positive regulation of arginine catabolism (roc
AIEVAWSRGNIDSISSLFGYTVSMTKAKPTNSEFIAMVADKLRLEHKAS" complement (123101. .124397)
/gene="spoive" complement (123101. .1233119)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /function="DNA repair and genetic recombination"/codon_start=1
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similar to hemolysin-like"
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                                                                                                                                                         complement(123120. .124397)
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                      RRYPLVKVIVLPALVQGENASRSIVTRIEEANEKEICDVLIVGRGGGSIEELWAFNEE IVRAAIFASNIPIISAVGHETDFIISBVADIRAATPRGAMEIAVPHTTDLIERTKTA EIVRAAIFANIPIISAVGHETOTLGSSYAFRFPKRYA VOKEQOFDAYOOFQAQLTALLD KKSRQLERETYRLEALHPHEGLKOARTRYGEQTNGLKKNNNIQMKOLHSQFQTVLGKI NALSPLOVNERGYSLAKEDKLIKSVSQIEEQDRLEKKKNDGVLTCEVLEKRGEEK" complement(132419. .133270)
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LNMTSLSINEINIHYGIOFDTKAQEVQIDEEM"
complement(134369. .135721)
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ADEAFCIGPKASKDSYLNVTNIVSVAKLTGTDAIHPGYGFLAENADFAELCEEVNVTF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ASHSYVRGKKKAAETMGMNFKLDQFDSSLTEAELLSIIDQYNQDPEFHGILVQLPLPD
HISEKAVIERISPDKDVDGFHPLAVGKMLLGEDTFLPCTPHGIVELLKKTNIDLSGKE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                VVVVGRSNIVGRPVGQLLLNENATVTYCHSRTENITEHTKKADILVVAVGRANFISAD
QIKEGAVVIDVGVNRLENGKLCGDVEFEGAKEKASFITPVPGGVGPYTITMLAHNTVK
PDGVGALYLAYEELKKKLAGEGLFDDRYKKQIPAFPATIGVVTSPTGAAVRDVITTLK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    'note="similar to hypothetical proteins from B. subtilis"
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/db_xref="GI:2634868"
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/note="alternate gene name: yqhX"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /note-"similar to transcription termination"
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/gene="yqhY"
complement(133902. 133924)
/gene="yqhY"
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                                                                                                                                                                                       /gene="fold"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /gene="yqhz
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GEVATEKAPAKODTKEKSGTETEKGKEDGTKGTKDSSADKETSAEASEKGTVYTETAD
DDLFTTYRLDLEDARSKEREELNAIVSSDDATAKEKSEAYDKMTALSEVBGTGKQLET
LIKTQGYEDALVNAEGDKINITVKSDKHSKSKATAIIDLVAKEIKTMKDVAVTFEPSK
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VKKAEERFSHDEYVGRIKLTAGEKVDSEEDIKTISVYMAPSSEKTVQTVAPVHIDT
DHAYVTKEAABQKERAKQIQTQLADIWEIGSEKITVHWEGGESVGNE"
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YVTAGSKVNENTVVCIVEAMKLFNEIEAEVKGEIVEVLVENGQLVEYGQPLFLVKAE"
complement(136334. .137024)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /protein_id="CaB14368.1"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /product="acetyl-CoA carboxylase subunit (biotin carboxyl carrier subunit)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /function="mutants block sporulation after engulfment (stage III sporulation)" codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /function="mutants block sporulation after engulfment (stage III sporulation)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /function="mutants block sporulation after engulfment (stage III sporulation)"
                                                                                                                                                                                                                                                                                                                                                                                          /function="long-chain fatty acid blosynthesis"
/note="alternate gene name: fabE, yqhw"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /db_xref="SWISS-PROT:P49783"
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complement(137707. .138327)
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                                                                                                                                                                                                                                                                                                 .136212)
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gene

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GYCSDITRTVAVGQPSDQLKEIYQVVFDAQALGVAHIKPGMTGKEADALTRDHIAAKG
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ASYSAVISDAELVPVAESVEKLRLIKSSEEIKILEEAAKIADDAFRHILTFMKPGISE
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /note="alternate gene name: yqhU, yqgF"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /note="similar to Xaa-Pro dipeptidase"
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complement(142713. .143774)
/gene="yqht"
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                                                                                                                                                                                            complement(141705. .141986)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    EVLANGKLLGTLILLTIFCVILQINAFQQSTVSKVAYSIVYMVLIILALNSFHVAI
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(stage III sporulation)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /function-"mutants block sporulation after engulfment (stage III sporulation)"
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                                                                                                                                                                                                                                                              terminator
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156402. .156632
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genes (postive regulation of comK; negative regulation of
aprE, kinB, sigD, spoOA, spoIIA, spoIIE, spoIIG)"
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gene

CDS

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LVFKKKSPARQMLICIRIPLVGKLVKLFNSYFFSLQLSSLLKSGLSIYDSLNAFKHQT
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KKHPNRNITYLEDPVETRBDYLQVQVNEKAGVYTSAGLKATLKHPDPMIILGEIRD
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /note="similar to hypothetical proteins"
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complement(159844. .160083)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       EWKANINGVDLNKQFPSLWEIEKYRKPTAPSYRDFPGISPLTEPESIAWYRLITENPP
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THE FEBASODISIOETY EWSRILMONIDE I EVFTEETY OVTHOLIANGK BAITHEE
APHAP IT DOLIGILPUVELD THRAKTILESVLEQCSALKLSVLFLDISGVP TVOTHVA
YQIFKVIDSTKLLGIVGELD THRAKTILESVLEQCSALKLSVLFLDISGVP TVOTHVA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /protein_id="cai.toi."
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ITDKKPQTIETVGGOIDIRPTLANALLGIDTKDQIQFGNDLLSDEKLDFTVLRDGSFIT
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GEEGRKTEAAVFONGKPTFTYLFIALQILMFSLLEINGGSTNTETLVAFGAKENSLIA
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DVFEAAGENDEIALEVVDYVAKHLGLVLGNLASSLNPSKIVLGGGVSRAGELLRSKVE
KTFRKCAFPRAAQAADISIAALGNDAGVIGGAWIAKNEWLKHQNC"
complement(175598. .175813)
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FVFSPYPSAGASGAIFGCLGALLYVALSNRKMFLRTIGTNIIVIIINLGFGFAVSNI
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CDS

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complement(182019. .182828)
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IVTHNMQQALRVSDRTAFFLNGELVEYGGTEGIFTSPKKOKTEDYINGKFG"
complement(182849. .183733)
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similar to phosphate ABC transporter (permease)"
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complement(182019. .182828)
                                                                                                                                                                                                                                                                                                                                        complement(181203. .181219)
                                                                                                                                                                                                                                                                                                                                                                                                  complement(181226. .182008)
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complement(188051. .189343)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      of peptidoglycan
in spore outgrowth
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     similar to phosphate ABC transporter (binding protein)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /note="similar to hypothetical proteins"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /function="involved in the synthesis associated with cell wall elongation (peptidoglycan biosynthesis)"
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                                                                                                                                                                                                                                                                                                               complement(184731. .185633)
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LGLDWWEHAYYLNYQNRRPDYISAFWNYVNWDEVARLYSDENNGTNKVLIMGPCFFMS
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GARHARKRATEYIVLRBHELDAGRIVSILCFLLIVALLKEDVGIPLSLAILGIGHPL
IYYPVKDIRFKEKEGENETWELDGGRRYTEPTLLKGER"
complement(189377. .190057)
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RVITDAYTYTKSATSIDAYAETNGKCGKLNYKSFGVSIVEGGDIGPQYSGYFSSRTPT
KKFYFSKLPKPTGTPWAVGLSVYKGKAKGAAFVYINPQKR"
                                                                                                                                                                                                  /note="alternate gene name: yqgD"
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/db_xref="G1:2634935"
/db_xref="SWISS-PROT:P54375"
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/db_xref="SWISS-PROT:P54484"
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                                                                                                 /gene="sodA"
complement(189377. .190057)
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FQQAGQFLPQANAGARNGAGGGLKGMLSRFLPGGGGAGSAGVPGIPGAGAAASGGA
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AMIKSHPYEEVAYDIYPVEQTPAEKGLGRVGTLKNEMTLKEFALFVKDKLDVNGVRMV
GDADSMVKKVAVLGGDGNKYIHHAKRKGADVYVTGDLYFHVAHDAMMLGLNVVDPGHY
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HAWHIREWILYKERYALIDED TILEBORKOYEVLVARAGDRDAAYDGISLSAGMLVGPFL
AKEKNAVFLKKWTQELQHTQSIYEQISQAADTEQNKQKLKELADRMELLKEVIDHG"
complement (2031401. . . 2031901)
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IVVGDPKSNNSNRLAQVSEEIAGTKAYRIGDLSELKLEWLKGVNTVAVTAGASTPTPI
TKEVIRFLEQFDHEDPSTWTTEHNIPLKKILPKVKAKN"
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/codon_start=1
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                                                                                                                                                                                                                                                                                                                                                                                                         /db_xref="SWISS-PROT:P54473"
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/gene="yqf0"
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complement(204202. .205345)
/gene="sigA"
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200551. .201495
/gene="yqfP"
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GAKQIVLHPGAHVGAGAEAGIKKIIEGLNEVIDPNQNVQIALETMAGKGSECGRSFEE
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197275. .197292
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COMPIEMENT (211778 . . . 212665)
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CDS

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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GIGCAGGCCICGCAGGTITAAAAACGCGTATTCCTCACGCTTCAGCTTGATTACCTCAIGTCGCAT-CG--C
25490 25500 25510 25520 25530 25540 25550
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0 25360 25310 25310 25380 25390 25400
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TTCATAAA--GGGTGATTTTAAGCCAGCTG-GT-AGGAATGGAT-TTACGCTCACGAATCGGCGGGT-TGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ACGCCGTTGCGCAGCTTTGCCAGCGACGCGTCGTCCGGCTCGCCTTCAACCTGCACATAGTAATTTTTCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CTGTCGCGATCCAGACGTCCCGCTGCGTAGACTCCCTGTACGG-GGAT-----AAAGTCCTTCAGCGTGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TGCGCCCGGCCTCGTCGGTAAACTGCGGCAATA---CATCGTAGGGTTTATTGAACAGTATG---ACCCGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GTACGTTTGCCCGGCTGAGTAAGCCTGGCCTGGAGCA--CGCCGTCATTGGTAAGGACCAGCAG-CCCTCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  -TATCATAGTCCAGACGCCCAATCGGATAAATGCGCTG--CGGAATATTTTTAAAAAAGTCCGTCACCACTT
25840 25840 25850 25860
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0
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Blattner,F.R., Plunkett,G. III, Bloch,C.A., Perna,N.T., Burland,V.,
Ribey,M., Collado-Vides,J., Glasner,J.D., Rode,C.K., Mayhew,G.F.,
Mau,B. and Shao,Y.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Submitted (13-0CT-1998) Laboratory of Genetics, University of Wisconsin, 445 Henry Mall, Madison, WI 53706, USA This sequence was determined by the E. coli Genome Project at the University of Wisconsin-Madison (Frederick R. Blattner, director). Supported by NIH grants HG00301 and HG01428 (from the Human Genome Project and NGH87). The entire sequence was independently determined from E. coli K12 strain MG1655. Predicted open reading frames were determined using GeneMark Software, kindly supplied by Mark Borodovsky, Georgia Institute of Technology, Atlanta, GA, 3032 [e-mail: mark@amber. gatech-edu]. Open reading frames that have been correlated with genetic loci are being annotated with GS Site Nos., unique ID nos. for the genes, in the E. coli Genetic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Submitted (02-SEP-1997) Guy Plunkett III, Laboratory of Genetics, University of Wisconsin, 445 Henry Mall, Madison, WI 53706, USA. Email: ecoli@genetics.wisc.edu Phone: 608-262-2534 Fax:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Submitted (16-JAN-1997) Guy Plunkett III, Laboratory of Genetics, University of Wisconsin, 445 Henry Mall, Madison, WI 53706, USA. Email: ecoli@genetics.wisc.edu Phone: 608-262-2534 Fax:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Bacteria; Proteobacteria; gamma subdivision; Enterobacteriaceae;
                                                                                                                         TTGGCTGGGGTTCTGGCGTTCTTCTGGTGGCTT--GTCGTGAGCTGAATCG-----CTCAACCCGGTGTTTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AE000308 11961 bp DNA BCT 01-DEC-2000
Escherichia coli K12 MG1655 section 198 of 400 of the complete
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               The complete genome sequence of Escherichia coli K-12 Science 277 (5331), 1453-1474 (1997) 97426617
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         to: 11961
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ae000308 TOIG of: ae000308 check: 6916 from: 1
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AE000308 U00096
AE000308.1 GI:1788508
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Blattner, F.R.
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Blattner, F.R.
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Plunkett,G. III.
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Escherichia coli K12
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Stock Center (CGSC) database at Yale University, kindly supplied by Mary Berlyn. A public version of the database is accessible (http://cgsc.blology.yale.edu). Annotation of the genome is an ongoing task whose goal is to make the genome sequence more useful by correlating it with other data. Comments to the authors are appreciated updated information will be available at the E. coll Genome Project's World Wide Web site. Coll K12 sequence and its annotations are periodically updated; this is version M54. No sequence changes. Annotation updates: updated gene identifications and products; all new functional assignments courtesy of Monica Riley; added promoters, protein binding sites, and repeated sequences described in reference 1. The unique numeric identifiers beginning with a lowercase 'b' assigned to each gene (protein- or RNA-encoding) are now designated as gene synonyms instead of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LSWHY IFWILALAAILASAMIFFLIKETLPPERROPFHIRTTIGNFAALFRHKRVLSY
MLASGFSFAGHESFLSAGPRYIEINHYAPENGYSTFALNTELFWRFNRI
MLASGFSFENGHESELAAWWYISALLGLGFRSLVVGYAAFVGGVSANGSSNAMYILDE
FPHMAGTASSLAGTFRFGIGAIVGALLSLATFNSAWPMIWSIAFCATSSILFCLYASR
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/transl_table=11
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/protein_id="AAG75241."
/db_xref="G1:J78510"
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IDTTGLVLMTDDGQWSHRITSPRHHCEKTYLVTLESPVADDTAEQFAKGVQLHNEKDL
TKPAVLEVITPTQVRLTISEGRYHQVKRMFAAVGNHVVELHRERIGGITLDADLAPGE
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               VMRFFHGLAAAAASVVINALMRDIYPKEEFSRMMSFVMLVTTIAPLMAPIVGGWVLVW
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /product="bicyclomycin resistance protein; transmembrane
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /runction="transport; Drug/analog sensitivity"
/note="f396; 99 pct identical to BCR_ECOLI SW: P28246"
/codon_start=1
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//Dound_moiety="CynR predicted site"
2167. .2197
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/note="factor Sigma70; predicted +1 start at 2276375"
complement(197. .1387)</pre>
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/note="factor Sigma70; predicted +1 start at 2278597"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Location/Qualifiers
1. .11961
/organism="Escherichia coli K12"
/strain="K12"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /sub_strain="MG1655"
/db_xref="taxon:83333"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   complement(197, .1387)
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KLIYSTNALEVSGPRSKGQFSIKDGVSKNYELDGSGLILVMEDTQALDTILLKHATWO
SGLKDTGKTVQANAVYDLGRSYQNGSITYSSKAISENMVINNGRANVWAGTWVNSVR
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AEAGTAVSYHMDLQNGTLEPMIKAAYNOEYADSNOYKVNDDGKFNNDVAGTSGVYQA
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10358. . 10386
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KQMPALAGFAEQNISFTRHMSSGNTTDNGIFGLFYGTSPSYMGGIGSTRTPAALITAL
MOGGYQLGLEFSDGFTSPLYRQALLSDFSMPSVRTQSDEGTATQMINMLGRYAGEDNR
WFSWYSFNGYN IDDSSNQAPARKYSRAAGWYDDQIRRYLNALRBSGKLDNTVVITTAG
RGIPLSEEEETFDWSHGHLQVPLVIHWPGTPAQRINALTDHTDLMTTLMQRLLHVSTP
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LOTTYETLLDUGANHSWSLAENRAQITPSTTDVLMAAAQBUYDTABLAGSVV
KGVSYDTAAWSSA INTRNAVTTAAAGFEGTLTGLTLGIDSRESRESSTIRGLIFGS
SHSDIGFDRGGKGNIDSYTLGAYAGWEHQNGAYVDGVVKVDRPANTIHGKMSNGATAF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ASEYSOGODLFNPORRHYWTAADNDTLAITTPKKTLVLNNNGKYRTVNLRGERVKDE
KPQLSLLLQVLTDEKRFIAN"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /function="putative enzyme; Not classified"
/note="0586; 100 pct identical to YBJM_ECOLI SW: P33922"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /product "putative ATP-binding component of a transport
                                               /function="orf; Unknown"
/note="075; 100 pct identical to YEJL_ECOLI SW: P33921"
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/product=ftRNA-Pro"
/function="RNA; tRNA"
7838. .7914
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/gene="yejo"
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                                                                                                                                                                                                                                                                                                                                                                                                                           6003. .7763
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/gene="proL"
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BERRYLTEHEKGRYGRKVADENDFEMDFLGASEGLIARAQNRGELJQAVDDFTAEQUIDKAE
RQWYRQQYYSYCNEQLQAGEBIELKSLSKELAGVSEWSFTERAGGYELEESFPADR
STLRQLTKFAGSGGGLTINFDAMLLGERIFWDPATDTLTIKGTPPNLRDQLQRRTSGG
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ARLARGRVIYLAHVKELVAQNHAKYQALGIEADIFAAGLKKESHGKVVFGSYQSYQAR
NLDAFQGEFSELLIYDECHRIGDDESQSYQQILTHITKVNPHLRLIGITATPFRLGKGW
IYQFHYHGWYRGDEKALFROCIYELPLRYMIKHGYLIPPERLDMPVVQYDFSBLQAQS
NGLFSEADLNRELKKQQRITPHIISQIMEFAATRGVMIFAATVEHAKEIVGLLPAED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /trānslation="MFTINAEVRKEQCKGASRRLRAANKFPAIIYGGKEAPLAIELDH
DKVMNMQAKAEFYSEVLTIVVDGKEIKVKAQDVQRHPYKPKLQHIDFVRA"
                                                                                                                                            /function="putative enzyme; Not classified"
//function="o586; residues 1-396 are 100 pct identical to 396
//estidues of YEJH_ECOLI SW: P33919 (403 aa) and residues
493-586 are 100 pct identical to aa 2-95 of YEJJ_ECOLI SW:
P36927; residues 404.4477 are 100 pct identical to
YEJI_ECOLI SW: P36926 (89aa)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       FWGKTTADGTLIEHFGRRCQGWFEDDGHREQCDFRFRFKNCPQCNAENDIAARRCRE
CDTVLVDPDDMLKAALRLKDALVLRCSGMSLQHGHDEKGEWLKITYYDEDGADVSERF
RLQTPAQRTAFEQLFIRPHTRTPGIPLRWITAADILAQQALLRHPDFVVARMKGQYWQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AALITGDTPGAERDV LENFKAQRFRYLVNVAVLTTGFDAPHVDLIAILRPTESVSLY
QQIVGRGLRLAPGKTDCLILDYAGNPHDLYAPEVGTPKGKSDNVPVQVFCPACGFANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /translation="MSLDINQIALHQLIKRDEQNLELVLRDSLLEPTETVVEMVAELH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             RVYSAKNKAYGLFSEESELAQTLRLQRQGEEDFLAFSRAATGRLRDELAKYPFADGGF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /function="orf; Unknown"
/note="f335; 100 pct identical to YEJK_ECOLI SW: P33920"
/codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               4514. [4547]
/note="REP (repetitive extragenic palindromic) element;
contains I REP sequence"
complement(4567. 5574)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         synthesis, modification"
/note="094; 100 pct identical to RL25_ECOLI SW: P02426"
/codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   5707. .5734

/note="factor Sigma70; predicted +1 start at 2282134"

5756. .5983

/note="yol"

/note="yol"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       complement(5580. .5608)
/note="factor Sigma70; predicted +1 start at 2281966"
5707. .5734
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             function="structural component; Ribosomal proteins -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                4032. .4060
/note="factor Sigma70; predicted +1 start at 2280460"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /transl_table=11
/product="50s ribosomal subunit protein L25"
/protein_id="AAC75246.1"
                                                                                                                                                                                                                                                                                                                                                                                     /product="putative ATP-dependent helicase"
/protein_id="AAC75245.1"
/db_xref="GI:1788511"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /transl_table=11
/product="orf, hypothetical protein"
/protein_id="AAC75247.1"
/db_xref="G1:1788513"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              complement(4567. .5574)
/gene="yejK"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                VREKVEDYEGRFRLAHELRG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /db_xref-"GI:1788512
                                                                                                                                                                                                                                                                                                                                                                     /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             4144. .4428
/gene="rply"
/note="b2185"
                                                                                                                                                                                                                                                                                                                                     /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /note="b2186"
                                                   /note="b2184"
2259. .4019
                                                                                      2259. .4019
/gene="yejH"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   4144. .4428
/gene="rply"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ′gene="yej
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                promoter
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gene
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CDS

promoter

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1 (bases 1 to 39149)
Richterich,P., Lakey,N., Gryan,G., Jaehn,L., Mintz,L., Robison,K.
and Church,G.M.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Bacteria; Proteobacteria; gamma subdivision; Enterobacteriaceae;
Escherichia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 90 | 500 | 510 | 520 | 530 | 550 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 |
                                                                GTATAGCTATCGATATACCTTTGCCGCCGCGATCAAAACCAATATCAGAATGAGAGTAACCAAAGATCAAG

9610 8610 8620 8630 8640 8650 8650 8660 8670
                                                                                                                                                                                                             GGTGATTTTAAGCCAG-CTGGTA---GGAA-TGGATTTACGCTCACGAATCGGCGGGTTGC--GCGGC---C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GTACGTTTGCCCGGCTG-AGTAAGCCTGGCCTGGAG--CACGCCGTCATTGGTAAGGACCAGCAGCCCCTCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 .20 430 440 450 460 470 480 200 CTGTGGGGATAAGTCCT-TCAGGGTGGGGCCC
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        630 640 650 650 ---ATCANTGCGCATTATCAG--CGGTT----ATCAATTGCCGCATTATAGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             400
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U000008
                                                                                                                                                                                   260
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     6. US-09-252-691C-1394' (1-669)
u00008 TOIG of: u00008 check: 8999 from: 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TOIG of: u00008 check: 8999 from: 1 to: 39149
   190
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                                                                                                                                                                                   250
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CCGCGAATTGTACTGCTTTCTTCACGGGAGAAACGG
8680 8680
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                                                                                                                                                                                   240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        U00008.1 GI:453985
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ECOHU49
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ACCESSION
VERSION
KEYWORDS
SOURCE
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  JOURNAL
REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                8330
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /transl_table=11
/product="155 transposase"
/product="155 transposase"
/protein_id="AAC75252.1"
/db_xref="61:178518"
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PWQNMYEVIEPFYPKAGNGRRPYPLETMLRHCMQHWYNLSDGAMEDALYEIASMRLE
ARSISLOSALDRTTIMNERHLLEQHQLARQLRFTINNMLAEAVMMYGGTLVDATIIE
ARSSTRNKEQQRDPEMHQTRKGNQWHFGMKAHIGVDAKSGLTASLVTAANBHDLNQL
GNLLHGEEQFYSAADGYQGAAPQREELAEVDVDWLIABEPGKVRTLKQHFRKNKTAINI
EYMKASIRARVEHPFRIIKRQFGVKARYKGLLKNDNQLAMLFTLANLFRADQMIRQW
                                                         10532. .10654
/gene="b2191"
/function="orf; Unknown"
/note="040; This 40 aa ORF is 38 pct identical (1 gap)
to31 residues of an approx. 384 aa protein ILEU_HUMAN SW:
                                                                                                                                                                                                                                                                                                                                                                                                                             /translation="MGEYKEGANKRGNSSRLTQSFHFFMFEPIFSPVNALNQPI"
complement(10539. .10568)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /function="IS, phage, In; Transposon-related functions"
/note="f338; 98 pct identical to YI52_ECOLI SW: P03837"
/codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TCAGTIC - - TCCTTAG - - - GGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TAACATC - CCGCC - - - - ATTCCCCGTTTGCCAGCGAGTCCAGCGTATAGCTGCCCATGGCGTAGCGAATGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                      /note="factor Sigma70; predicted +1 start at 2286925" /note="1556".11740
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 complement(11817. .11843)
//octe="factor Sigma70; predicted +1 start at 2288203"
complement(11856. .11886)
//octe="factor Sigma70; predicted +1 start at 2288242"
11961. .>11961.
//octe="factor Sigma70; predicted +1 start at 2288389"
//octe="factor Sigma70; predicted +1 start at 2288389"
//octe="factor Sigma70; predicted +1 start at 2288389"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /note="factor Sigma70; predicted +1 start at 2286955"
complement(10692. .11708)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Optimized Score = 291 Significance = -0.78
Matches = 358 Mismatches = 275
Conservative Substitutions = 0
'note="factor Sigma70; predicted +1 start at 2286786"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        80
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                                                                                                                                                                                                                                                                      /codon_start=1
/transl_table=11
/product="orf, hypothetical protein"
/protein_id="AAC75251.1"
/db_xref="G1:1788517"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       complement(10569. .10597)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /gene="trs5_8"
/note="b2192"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /gene="trs5_8"
                         10532. .10654
/gene="b2191"
10532. .10654
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promoter promoter promoter

BASE COUNT

ORIGIN

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REFERENCE

COMMENT

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/codon_start=1
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Homologous to ABC-type transporters; closest similarity to
oliopeptide transporters. Close proximity of inferred
start and stop codons suggests translational coupling
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TEYAARNYPDAAELVLLAPMKKDLPSEVFTQIYQPPVSKGDGYDRDNLLRADKLLNEA
GGVLKGQQRVNATTGQPLSFELLLPASSNSQWVLPFQHSLQRLGINMDIRKVDNSQIT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NRMRSRDYDWMPRYWRAMPWESSDLQISWSBYINSTYNAPGYQSPYIDSLINQIIAA
QGNKEKLLPLGRALDRYLTWNYYMLPWWYMAEDRLAWWDKFSQPAVRPIYSLGIDTWW
YDVNKAAKLPSASKQGE"
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/translation="MGAYLIRELLVIPTLWAIITINFIVOIAFGGPVDQAIAAIEF
/translation="MGAYLASHAQTGVGGISDSNYRGGRGLDPEVIAEITHRYGFDKPIHER
YFKMLWDYIRFDFGDSLFRSASVPDAD"
                                                                                                                                                                                                                                                                                                                                                                                                                    Please
                                                                                                                                                                                                Direct Submission
Submitted (10-FBB-1994) Department of Genetics, Harvard Medical
School, 200 Longwood Avenue, Boston MA 02115
On Feb 10, 1994 this sequence version replaced gi:405903.
From E.coli K12 BHB2600. All of the sequence in this contig was sequenced at least twice on one strand and once on the other strand, except in the 2 regions marked. The annotation of this sequence should be considered preliminary and incomplete. Please contact KNobisonencleus.harvard.edu before citing this sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /note="probable integral membrane component of transport complex (oligopeptides?); C-terminus may be truncated to form yejC"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /gene="probable transport operon; yejA-yejB/C-yejE-yejF.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Homologous to ABC-type transporters, closest similarity oliopeptide transporters. Close proximity of inferred
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submitted (29-SEP-1993) Department of Genetics, Harvard Medical
School, 200 Longwood Avenue, Boston MA 02115
3 (bases 1 to 39149)
Robison, K.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /note="weak match to heme-binding protein from
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /organism="Escherichia coli"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /protein_id="AAA16375.1"
/db_xref="GI:453986"
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JOURNAL
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JOURNAL
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                                                                                                                                                                           AUTHORS
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CDS

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FEATURES

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ERORVWILAMALLTRPELLIADEPTTALDVSVOAQILQLIKELÖGELINNGMLFTTHNLS
IVRKLAHRVAVMONRCVEONYAATLEASPHPPTOKILNEBESGDPVPLPERASTL
IVRKLAHRVAVMONRCVEONYAATLEASPHPPTOKILNEBESGDFOKTLALLK
LINSQGSITFDGOPLONLNRRQLLETRHRIQVVFODPNSSLNPRLNVLQIIEEGLRVH
OPTLSAAQREQOVIAVWHEVGLDPETTHRYPAEFSGGORQRIAIRRALILKPSLIILD
                                                                                                                                                                                                                                                                                              AGALQGYYGGKVDLWGQRFIEVWSGMPTLFLIILLSSVVQPNFWWLLAITVLFGWMSL
VGVVRAEFLRTRNFDYIRAAQALGVSDRSIILRHMLPNAMVATLTFLPFILCSSITTL
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GSGKSVTALSILRLLPSPPVEYLSGDIRFHGESLLHASDQTLRGVRGNRIAMIFQEPM
VSLNPLHTLEKQLYEVLSLHRGMRREAARGEIINCLDRVGIRQAAKRLTDYPHQLSGG
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HDAVADCHOTAQUGFRYFWIARQQYCYCSTDDDDHPTVLFDEPVAMKLHAAGRLD
IDTTGLYLATDDGQMSHRITSPRHCERTYLYTLESPVADDTAEQFRKGVQLHNERDL
TKPAVLEVITPTQVRLTISEGRYHQVRRMFAAVGNHVVELHRERIGGITLDADLAPGE
                                                                                                                                                                                   /	anslation="MSRLSPVNOARWARFRHNRRGYWSLWIFLVLFGLSLCSELIAND
                                                                                                                                                                                                                          KPLLVRYDGSWYFPLLKNYSESDFGGPLASQADYQDPWLKQRLENNGWVLWAPIRFGA
                                                                                                                                                                                                                                                                FSINFATNKPFPSPPSRQNWLGTDANGGDVLARILYGTRISVLFGLMLTLCSSVMGVL
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KLLSPDGDNAMSVMYKLSQALSDIEVPCSVLECEGEPCLFVNRQDEFAATCRLKNFGV
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IYGPWADSFGRKPVVLGGTLVFAAAAVACALANTIDQLIVMRFFHGLAAAAASVVINA
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WVISALLGLGFWSLVVGVAAFVGCVSMVSSNAMAVILDEFPHMAGTASSLAGTFRFGI
                                                                                                                                                                                                                                                                                                                                                                           FSLDFLGFGLPLGSPSLGELLLQGKNNLQAPWLGITAFLSVAILLSLLIFIGEAVRDA
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /note="ABC-type ATP-dependent transport protein, perhaps of oligopeptides"
                                                                                                                                                                                                                                                                                                                                                                                                                             3353. 4942
/gene="probable transport operon; yejA-yejB/C-yejE-yejF.
/gene="probable transporters; closest similarity
oliopeptide transporters. Close proximity of inferred
start and stop codons suggests translational coupling
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from Buchnera aphidicola and orf near centisome 89"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GAIVGALLSLATFNSAWPMIWSIAFCATSSILFCLYASRPKKR'
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/note="bicyclomycin resistance gene"
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/db_xref="GI:405910"
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/db_xref="GI:405907"
                                                                                                           /protein_id="AAA16378.1"
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/db_xref="G1:424052"
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/note="GTG start codon"
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                                                                                                                                         /db_xref="GI:4059
/codon_start=1
/transl_table=11
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/transl_table=11
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                                                                            /product="yejE"
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CDS

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WFSWVSFNGTNIDDSNQQAFARKYSRAAGNVDDQINRVLNALRDSGKLDNTVVIITAG
RGIPLSEEEEFFDWSHGHLQVPLVIHWPGTPAQRINALTDHTDLMTTLMQRLLHVSTP
ASEYSQGQDLFNPQRRHYWVTAADNDTLAITTPKKTLVLNNNGKYRTYNLRGERVKDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /TITALSTATION="YOREEFPRLFAPSLYSPIALASTVEYGETVDGVVLEKDIQLVYG
TANNTKINPGGEQHIKEFGYSNNTEINGGYOYIEMNGAAEYSYLNDGYQIYOMGGAAN
QTTLNNGYLQYGAANDTTIKGGRLIPKBGGAAFVAIEKGGLLEVKEGGFAFAVDK
AGGAIKTTTRAMYGETNRLGOFDIKNGIANNHLLENGGSLRYEENDFAYNTYDSGG
LLEVMDGGTYTGVDKKAGGKLIVSTNNLLEVSGOFSIKDGSSKNYELDDGSGLI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /translation="MILIKPQETTMPEATPFQVMIVDDHPLMRRGVRQLLELDPGSEV VARAGDGASA DLAMRLDIVVILLDLIMRGMSGLDTLMALRENGVTAD II LITVYSDAS SDVFALIDAGAADGYLENGSVPERVNQYLEREREMFGAEDP FSVLTERELDVLHELAGGLSNKQIASVLNISEGTVKVHIRNLLRKLNVRSRVAATILF
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PGDIEGWIMLGRYGMALGNASIATDAYATAYRLDPKNSDAALGYAEALTRSSDPNDNR
LGGELLRQLVRTDHSNIRYLSMYAFNAFEQRRGEAVAAWEMMLKLLPANDTRRAVIE
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FITLTTNTLSGNGNFYMRTDMANHQSDQLNVTGQATGDFK I FVTDTGASPAAGDSLTL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VTTGGGDAAFTLGNAGGVVDIGTYEYTLLDNGNHSWSLAENRAGITPSTTDVLNMAAA
QPLVFDAELDTVRERLGSVKGVSYDTAMWSSAINTRNNVTTDAGAGFEQTLTGLTLGI
DSRFSREESSTIRGLIFGYSHSDIGFDRGGKGNIDSYTLGAYAGWEHQNGAYVDGVVK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DYTLSNGMRADVGNTRILRAEAGTAVSYHMDLQNGTTLEPWLKAAVRQEYADSNQVKV
NDDGKFNNDVAGTSGVYQAGIRSSFTPTLSGHLSVSYGNGAGVESPWNTQAGVVWTF"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /translation-"MRFLLGVLMLMISGSALATIDVLQFKDEAQEQQFRQLTEELRCP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          KCQNNSIADSNSMIATDLRQKYYELMQEGKSKKEIVDYMVARYGNFVTYDPPLTPLTV
LLWVLPVVAIGIGGWVIYARSRRRYRVVPEAFPEQSVPEGKRAGYVVYLPGIVVALIV
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                                                            KOMPALAGFAEONISFTRHMSSGNTTDNGIFGLFYGISPSYMDGILSTRTPAALITAL
                                                                                      NOOGYOLGLESSDGFTSPLYROALLSDFSMPSVRTQSDEQTATQWINWLGRYAQEDNR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   INNGRANVWAGTMVNVSVRGNDGILEVMKPQINYAPAMLVGKVVVSEGASFRTHGAVD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         VDRFANT I HGKMSNGATAFGDYNSNGAGAHVESGFRWVDGLWSVRPYLAFTGFTTDGQ
RSLTRRRFFARPLAAFLFIAFIASHVVYIWADANFYRPITMQRANLPLSYPMTARRFL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                VMEDTQAIDTILDKHATMQSLGKDTGTKVQANAVYDLGRSYQNGSITYSSKAISENMV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /note="probable thioredoxin; may be part of aeg-46.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /note-"strong match to pertactin from Bordetella. start codonmay be missing some of N-terminus"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           18231. .18385
/rpt_family="REP/PU"
complement(18411. .19463)
/note="probably part of aeg-46.5 operon; homolog
Rhodobacter cc12"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /note="regulatory protein narP"
                                                                                                                                                                                                                                                                                                     /note="codon recognized: CCC"
/product="tRNA-Pro"
13264. .13346
/gene="proL"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                complement(19460. .20017)
                                                                                                                                                                                                                                                                                                                                                                                                                        complement(13443. .16010)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /protein_id="AAA16385.1"
/db_xref="GI:405918"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /protein_id="AAA16411.1"
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/db_xref="G1:405919"
                                                                                                                                                                                                               KPQLSLLLQVLTDEKRFIAN"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            15970. .17170
/rpt_family="IS5"
17523. .18200
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/transl_table=11
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/transl_table=11
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/codon_start=1
                                                                                                                                                                                                                                               13264. .13346
/gene="proL"
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hrwviryvrganialrliehevtwtvllrqrvaivsdimfrkqfercitddfaldddt
iaadftpgnstanaellcdkfikshVcdfacknggraltrksellsaqysglitslkg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ARLARGRVLVLAHVKELVAQNHÄRYQALGLEADIFAAGLKRKESHGKVVFGSVQSVAR
NLDARQGEFSLLIVDECHRIGDDESQYQQILTHLTKVNPHLRLLGLTATPFRLGKGW
IYQEHYHGMYRGDERALFRDCIYELPRXMIKHGYLTPPERLDMPVVQYDFSRLQAQS
NGLFSEADLNRELKRQORTPHISQIMEFAATRKVMIFAATVEHAKEIVGLLPAED
AALITGDTFQAARDVLENFRQNRRYLVNVAVLTYGFDAPHYDLIALLRPPESVSLY
QQIVGRGLRLAPGKTDCLILDYAGNPHDLYAPEVGTPKGKSDNVPVQVFCPACGFANT
FWGRQRPPTGH"
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RONVRQQVYSYCNEQLQAGEEIELKSLSKELAGVSEVSFTEFAAEKGYELEESFPADR
STLRQLTKFAGSGGGLTINFDAMLLGERIFWDPATDTLTIKGTPPNLRDQLQRRTSGG
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INTSIAPAQRQAIANSFARALQSSINEDKAH"
                            expressed; yejD on opposite strand has
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /translation="MIFTLRPYQQEAVDATLNHFRRHKTPAVIVLPTGAGKSLVIAEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 RVYSAKNKAYGLFSEESELAQTLRLQRQGEEDFLAFSRAATGRLRDELAKYPFADGGF
                                                                                                                                                                                                                                                                                                                                                              7685. .8896
/note="some similarity to a phage protein and
restriction-modification systems"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          // Agene="yejz -- may be frameshift fragment" 9117 9446 // Gene="yejz -- may be frameshift fragment" 9571. 9861
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/note="ribosomal protein L25"
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                                                                                                                                               /product-"bicB/yeib"
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/db_xref="G1:405911"
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complement(9993. .11000)
                            /note="probably not expetter dicodon usage"
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/transl_table=11
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /product="yejH"
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                                                                                            /codon_start=1
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CDS

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/translation="Miearelicerdertlesglsftlnagewyoltgsngagkttll
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /translation="weegelinkshdikkalcqwtamlalvvsgavwaangvdpsqsp
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GaprispthfwbsdgrVgaEvaprryfclQcQyrrpiprQswgipLphqkvTgNrkll
Weiltyslv"
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/db.xref-"G1:405930"
/translation-"MRPFRAPKCAQAVRWIVRLNRSTTRGWGWRYWWTRKTVSTFRGL
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AATDRQKCNRCMDCFHVCPEPHVLRAPVLDBQSPVQVTSRDCMTCGRCVDVCSEDVFT
ITTRWSSGAKS"
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complement(24073. .24690)
/note="ABC-type ATP-dependent transporter; may be part of
aeg-46.5 operon"
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/note="possible ferredoxin; GTG start.codon; may be part
of aeg-46.5 operon"
                                                                                                                                                                                                                                                                                                                                                                          GVDRLTQRWAQHTEQGGIVILITHQPLNVAESKIRRISLTQTRAA"
complement(24709. 25311)
/note="may be part of aeg-46.5 operon; strong similarity
to nirT from P.stutzeri"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              QKSVAAKMHDQAVKDGQTCIDCHKGIAHKLPDMREVEPGF"
complement(25281. 25790)
/note=may be part of aeg-46.5 operon; match to
periplasmic nitrate reductase B subunit (napB) from
Alcaligenes eutrophus; weak match to Human guanylate
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/note="may be part of aeg-46.5 operon; weak match
ferredoxins"
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/note="may be part of aeg-46.5 operon; weak match
several proteins with redox functions"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       KVLPLSLAKGELGHHYRFGWLEGNNGKS"
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                                                                                                                                                                                        /product="yejw"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LLFMSVAGAFLVLVNAFVVNDFTVTYVASNSNTQLPVWYRVAATWGAHEGSLLLWVLL
MSGWTFAVAIFSQRIPLDIVARVLAIMGMYSVGFLLFILFTSNPFSRTLPNFPIEGRD
LNPLLQDPGLIFHPPLLIMGYVGFSVAFAFAIASLLSGRLDSTYARFTRPWTLAAWIF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             LTLGIVLGSAMAYYELGWGGWMFWDPVENASFWPWLVGTALMHSLAYTEORASFKAWT
LLLAISAFSLCLLGTFLVRSGVLVSVHAFASDPARGWFILAFWYLVIGGSLLLFPARG
HKVRSRVNNALWSRESLLLANNVLLVAAMLVVLLGTLLPLVHKQLGLGSISIGEPFFN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /translation="MNIRRKNRLMIACAVLAGLALTIGLVLYALRSNIDLFYTPGEIL
YGKRETQQMPEVGQRLRVGGWVWPGSVQRDPNSLKYTFTIYDAEGSVDVSYEGILPDL
FREGGGVVVQGELEKGNHILAKEVLAKHDENYTPPEVEKAMEANHRRPASVYKDPAS"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MTVLGLAMACWIAVLAIAEAALRISRGTKTTFSYWGMYAAHLGLAVTIVGIAFSQNYS
VERDYRMKSGDSVDIHEYRFTFRDVKEVTGPNWRGGVATIGVTRDGKPETVLYAEKRY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /translation="MTPAFASWNEFFAMGGYAFFVWLAVVMTVIPLVVLVVHSVMQHR
AILRGVAQQRAREARLRAAQQQEAA".
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /translation-"WKKTLHQLAIPPRLYQICGWFIPWLAIASVVVLTVGWIWCFGFA
PADYQGGNSYRIIYLHVPAAIWSMGIYASMAVAAFIGLVWQMKMANLAVAAMAPIGAV
FTFIALVTGSAWGKPWWGTWWVWDARLISELVLLFLYVGVIALWHAFDDRRLAAVRQV
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VYGLPLLILSPLVAALLGMDYVGWQWALTLLLGTPPLGFLGAPGVALTVGIKRGGVL
LSILVLPLTIPLLIFATAAMDAASMHLPVDGYLAILGALLAGTATLSPFATAAALRIS
IQ"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TMFTWLMVPFALLLGVGPLVRWGRDRPRKIRNLLIIAFISTLVLSLLLPWLFESKVVA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         YNTAGSMMTEAAIDGGITRDLYAALGEELENGAWAVRLYYKPFVRWIWAGGLMMALGG
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                                                                                                                                                                                                                                                                  complement(20014. .21957)
/note="may be part of aeg-46.5 operon; strong match to
ccll from Rhodobacter and corresponding plastid proteins"
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/note-"homolog of helC from Rhodobacter; probably part of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       complement(23414. .24076)
/note="may be part of aeg-46.5 operon; homolog of
Rhodobacter helb and corresponding plastid proteins"
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/gene="yejT -- may be frameshift fragment"
complement(22881. .23372)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    LLCLFDPRYRRRVSPQKTAPEAV"
complement(21954, 22433)
/note="many be part of aeg-46.5 operon"
/codon_start=1
/transl_table=11
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/codon_start=1
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/db_xref="G1:405925"
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                       /transl_table=11
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SEEDRFEALKEYPQAKKEDWALWQAGGRVQIIKRDAEKGGVLRLGTEVVSDOGGTIA ALLGASPGASTAAPIMLNLLEKVFGDRVSSPQWQATLKAIVPSYGRKLNGDVAATERE LOYTSEVLGLWYDKPQAADSTPKPOLKPOPVQKEVADIAL"

COMPLEMENT (34023 ...35666)

/note="ABC-type ATP-dependent transport protein. Match to syrD from Pseudomonas syringae over most of length and outside ABC-family signatures."
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       OEYRHIIIRADTEHLSAVNWSNIXMICAIGLVEWMANSLGWADTNVAATYSLTLIELR
TPLLSAVGALPTLITAQVAFNKLNKRALAPEKAEFPRPQAFPUNGTLEIRNVTFAYOD
NAFSVGPINTIRKGELLFIGGNGSGKSTLAMLLTGLYQPQSGEILLDGKPVSGEQP
EDYRKLESAVFTDVMLEDQLLGPEGKPANPQLVEKWLAQLKMAHKLELSNGRYVNLKL
SKGCKKRVALLLALAEERDIILLDEWAADQDPHFRREFYQVLLPLMQEMGKTIFAISH
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PFRQMYTPGGYTMSVAMTNCGHLGWTTHRQGYLXSPIDPQTNKPWFAMPQSFHNLCOR
AATAAGYPDSCPAGACLINRYAFGAKLSLHQDKNEPDLRAPIVSVSLGLFAFIPGFGGLK
RNDPLKRLLLEHGDYAGTSTEFYHGIQPLKAGFHPLTIDCRYNLTFRQAGKKE"
complement(36392. 33456)
/note="DNA repair protein"
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                                                                                                                                                                                                                                                                                                  EKAVAINEAFQISRQFWAHQVERGVLRTPRSFINTVPHMSFVWGEDNVNFLRARYAAL
QQSSLFRGMRYSEDHAQIKEWAPLVMEGRDPQQKVAATRTEIGTDVNYGEITRQLIAS
                                                                                                                                                                                                                                                                                                                                                                                       LQKKSNFSLQLSSEVRALKRNDDNTWTVTVADLKNGTAQNIRAKFVFIGAGGAALKLL
QESGIPEAKDYAGFPVGGQFLVSENPDVVNHHLAKVYGKASVGAPPMSVPHIDTRVLD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DTSLLVLPEFLGLLLLLMAVTLGSQLALTTLGHHFVYRLRSEFIKRILDTHVERIEQL
GSASLLAGLTSDVRNITIAFVRLPELVQGIILTIGSAAYLWMLSGKMLLVTAIWMAIT
IWGGFVLVARVYKHMATLRETEDKLYTDFQTVLEGRKELTLNRERAEYVFNNLYIPDA
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GKRVVLFGPFATFSTKFLKNGSLWDLMSSTTTSNVMPMMHVGLDNFDLVKYLVSQVML
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /translation="MKKATCLTDDQRWQSVLARDPNADGEFVFAVRTTGIFCRPSCRA
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   EALADQVAMSPFHLHRLFKATTGMTPKAWQQAWRARRLRESLAKGESVTTSILNAGFP
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complement(37530. 38132)
/note="weak match to rnff from Rhodobacter capsulatus"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DDHYFIHADRILEMRNGOLSELTGEERDAASRDAVARTA
COMplement(35742. .36392)
    complement(32159. .33631)
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/transl_table=11
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                                                                                                                                 /product-"yojH"
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                                   complement(27319. .29748)
Acote="may be part of aeg-46.5 operon; strong match to the periplasmic nitrate reductase large subunit (napA) from Alcaligenes eutrophus; GTG start codon"
                                                                                                                                                                                                                                                                                                                                  /protein_id="AaA16399.1"
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/translation="mpvSACRAVARAVVGQQBAIKWDKLRWKNGKYDKEGEFTPITWD
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MASAVVGFWRTFGMDEPMGCYDDIEQADAFVLMGANMAEMHPILMSRITNRRLSNQNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TVAVLSTYQHRSFELADNGIIFTPQSDLVILNYIANYIIQNNAINQDFFSKHVNLRKG
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KRCGVKLEEVV
29705. .29859
/note="CAUTION! Low coverage in this region of the
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EDIPCAKVCPSGALDREIESIDDARMGLAVLVDQENCLNFQGPALRCLLSRMPEN"
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Jebydroginate dehydratase; arcc gene; diaminopimelate decarboxylase; lysA gene; penicillin-binding protein; peptidyl-prolyl isomerase; phosphoglycerate dehydrogenase; ppiB gene; response regulator; response regulator kinase; ribA gene; ribB gene; ribD gene; ribD gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB gene; ribB g
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Agric. Biol. Chem. 55 (6), 1615-1626 (1991)
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Sorokin,A., Zumstein,E., Azevedo,V., Ehrlich,S.D. and Serror,P. The organization of the Bacillus subtilis 168 chromosome region between the spoVA and serA genetic loci, based on sequence data Mol. Microbiol. 10 (2), 385-395 (1993)
--ATAGGGTCTAACACTCCACAATCCGTCAACCC----AACGG----AACCCGGTCTCAACATG-AGCACCC 13830 13840 13850
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Buchanan, C.E. and Ling, M.L.
Isolation and sequence analysis of dacB, which encodes a sporulation-specific penicillin-binding protein in Bacillus
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-10_signal
protein_bind
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18185. 18203
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/note="for dacB; putative"

17396. 17402

/note="putative; ORFX13"

17418. 17421

/note="putative; ORFX13"

17440. 118129
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X 10 TCAGTTC----TCCTTAGGGGT

-0.98 288 0

Significance = Mismatches =

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CCTGGCTGTCGCGGT-CCAGACGTCCCGTGCGTACGGGGGATAAAGTCCTTCAGCGTGCTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GAAAGGTGTTTTTGAATTTCTGGGGTACATGGTGTGAACCGTGCAAAAAAGGTTTCCTTATATGGGGAAA
18460 18470 18480 18490 18500 18510
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GCCACT-----CGGGTTCATTCACA---CGTTCA-ATACCAGCGGCAGGGTGGGACCGTC---GTTCAGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AAGGGTGATTTTAAG-CCAGCTGGTAGGATGATTTA--CGCTCACGAATCGGCGGGTTGCGCGGCCACA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     280 290 300 310 340
THACGCCGITGCGCAGCTTTGCAGCTTTGAGCTTGCAGTAAATT--TT
                                                                                                                         20 30 40 80
AACATCCCGCATTCCCAGCGAGTCCAGG-TATAGCTGCCATGGCGTAGCGAATGAGTCGCA
                                                                                                                                                                                                                                       GGGTAGGGAAGC-CCACAT---GCGC-AG-TCATGCGCCTG----ACCTGTCG-GTTGCG-GCCTTCATA--
         Optimized Score = 279
Matches = 344
Conservative Substitutions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              440
                                                                                                                                                                                                                                                                                                                                                                                                                               170
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               33
478
96
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                   8 B B
                 Score
Identity
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                 Initial Residue
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DHPLVTATPHLGASTREAQLINVAAQVSEEVLGFAKGLPVMSAINLPAMTKDBFAKIKP
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VNAGGVAKERGISFSEKISSESEGYDNCISVKYTGDBETFTYATYIPFGERIVEIN
GFNIDFYPPTGHLVYIQHQDTTGVIGRVGRILGDNDINIATMQVGRKEKGGEAIMMLSF
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26909. . 26944
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VQHENVREISCALDGCTIDQRAVIILBRIQGYSIQETAKALRFSESKVKTTQHRGLKV
LKKHWELLREELMDDEVRMERRTDKGVVKSTSGS"
                                                                                                                                                                                                                                                                                                                   TEAGRATION—"MAKSEMNEEQIKELLSQLPAVKDHRSPQDIYKRLTWAKRKNKPA
VENTGPACAAATAVIAFI1SHFFDAQDQQQQRASSOBNAVKTGTEDESPRAASSLDQ
YSFYVGPEKDDNYTYAVADADTSALIPVSIQKTNADQTIQDMLFESSELGILDHAIT
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DONETGVRIGSSTFFFEISIRKQSKREXYLKOQNKQGQDFLVPSNHSFDTVKEALKEME
SSSQBDTTPLIQAGAVQSVTRKQKHLYMRFSKESEVDDSIAGILMIEGLLLTAKEFEFF
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24398. .24982
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /gene="serA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                       26019.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             terminator
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ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          gene
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                       CDS
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260

390

380

370

460

450

130

120

190

180

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TGGCTGGGGTTCTTGCTGTGGGTTGTCGTGAGCTGAATCGCTCA-ACCCGGTGTTTCTAAAAG
                                                                                                                                                                    CAAGACGTTCGCAAACCTATAAAAACGATCATCGACAAAATTTCGTTTTCCTCGGTTAAGGTGG
                                                                       610
                                                                                                                                            630 640 650 X -AAG-TITICGICAIGITITICAGGCG-TIAIC----AATIGCCGCATI--AIAGC
                                                                       009
                                                                        590
                                                                                                                                                                                                                 GAATATGGCTTATCGTCATAACCCTTGCCGCATCAG
19000 19010 19020 19030
                                                                        580
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